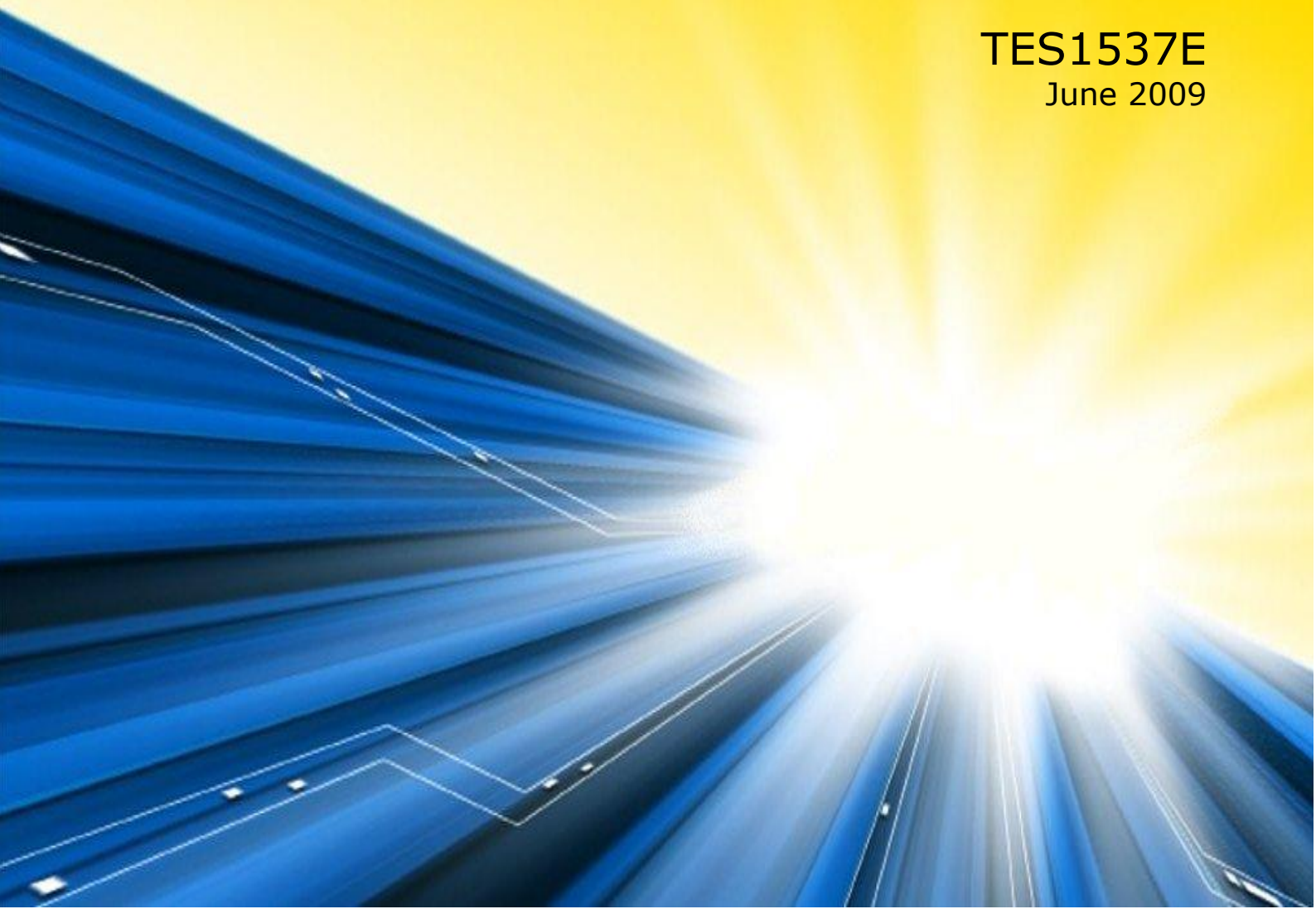
DX260/DX270 series
SMOKEMETER

SERVICE MANUAL

TES1537E

June 2009



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HEALTH AND SAFETY

1. The equipment is not weatherproof and should not be used outside in rain or snow.

2. The internal circuits and components of the analyser should not be tampered with. No internal parts are operator serviceable.

3. Operators should exercise due caution with regard to the engine fan and associated belts.

4. Always provide ventilation by using an exhaust gas extraction system or by having an adequate supply of fresh air.

5. Before starting an engine, ensure that the gear selector is in neutral or park.

6. Care should be taken with regard to scalding from the cooling system, burns from the exhaust system and electric shocks from the ignition HT system.

7. When disconnecting the fuel system of a hot engine beware of the fire hazard caused by fuel spilling onto manifolds, ignition distributor, etc.

8. Position the mains cable and sample probe in such a manner that they do not present a hazard to anyone.

9. The earth lead of the mains supply cable MUST ALWAYS be connected to a good earth point.

10. Operators should not allow themselves to come into contact with water or other similar conductors when using the equipment.

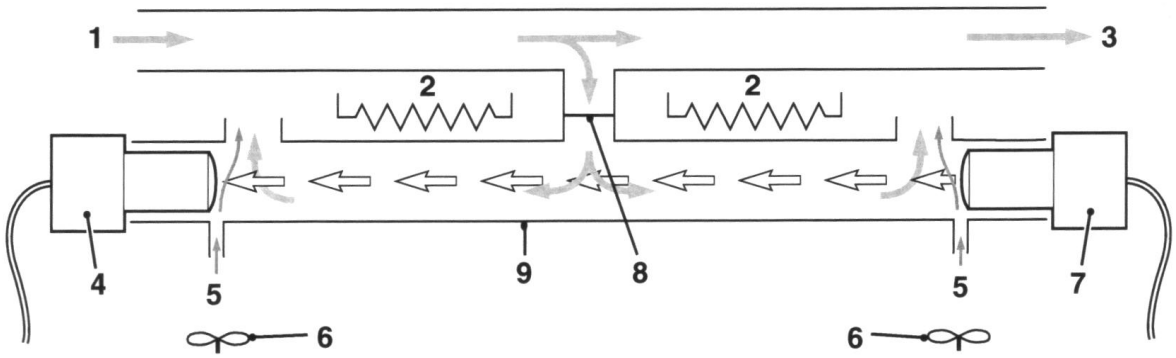
11. Equipment should only be serviced by authorised personnel.

12. All equipment should be sited in an area that is designated and clearly marked with the following: 'FOR USE BY AUTHORISED PERSONNEL ONLY'

EXTREME CARE SHOULD BE TAKEN WHERE THIS SYMBOL IS SHOWN

INTRODUCTION

A Smokemeter consists of a smokehead, an interface unit and a PC with operational software. The Smokehead is a partial flow opacimeter suitable for Free Acceleration and Full Load testing of all sizes and types of diesel vehicles. It consists of two main items, a smoke sampling head and a control unit.



Schematic diagram of smoke sampling head

1	Smoke inlet	6	Fan
2	Heater	7	Green LED
3	Bypass	8	Temperature sensor
4	Photo diode	9	Measuring tube
5	Purge air		

The sampling head (Smokehead) utilizes a green LED and a photodiode mounted at opposite ends of a measuring tube, such that the effective light path length through the smoke is 250 mm.

The measuring tube and the LED / Photodiode assemblies are heated such that their minimum temperature is 70ºC, thereby preventing condensation of the oil and water content of the smoke.

The temperature of the smoke is measured at the inlet to the measuring tube so that, if necessary, an automatic correction can be applied to the opacity readings for smoke temperatures other than 100ºC.

The smoke sampling head contains a fan to draw the smoke sample into the measuring tube via a by-pass system, so that the pressure inside the tube cannot normally exceed ambient by more than 7.5 mbar. This provides for rapid response and fast clearance of the smoke sample after testing.

The smoke sampling head operates at low voltage (24V DC), and is suitable for use in all weather conditions and at temperatures down to -15ºC. The monitoring equipment is NOT weather protected and should not be operated outdoors.

The lenses are protected by an air curtain which reduces sooting. In addition, the sampling head has an autorange feature which can provide a step change in LED intensity to compensate for dirtiness.

The measuring tube contains rings to eliminate reflection, and the LED is pulsed so that the detection system can ignore any ambient light level. Mid-point calibration is provided by automatically interrupting this pulse train to provide (for example) 3 pulses out of 8 to give a calibrated light level of 3/8 or 37.5% (patented).

Sampling probes are available to suit most exhaust systems including mid-chassis and vertical. Extension poles are available for very high vertical exhausts.

The smokehead communicates with a control PC either via a single 10m cable and Interface unit or via wireless (Bluetooth®) communications. The cable carries power to the head and data in both directions, for the wireless system the smokehead derives its power from internal rechargeable batteries.

Depending on national requirements, various tamperproof security systems may be included. In addition, the sampling head has its serial number stored in permanent memory and the sampling head contains a clock that provides information for the printout and also to control the calibration interval.

This equipment will operate from a mains supply of 100-240Va.c. single phase 50/60 Hz.
If the equipment is required to operate from a different supply to this it is essential that special equipment is ordered for your requirement.

The equipment should be stored and kept in a dry condition.

The Bluetooth® wordmark is a registered trademark owned by Bluetooth SIG, Inc. and any use of such marks within this manual is under license.

OPERATION

Cabled Smokehead (DX260-1/DX270-1)

Connect the smokehead cable to the Interface base unit. Ensure the Interface base unit has power and data cables connected. Switch on power to the Interface base unit. The 'Power On' light will illuminate and the Smokehead fan will briefly operate.

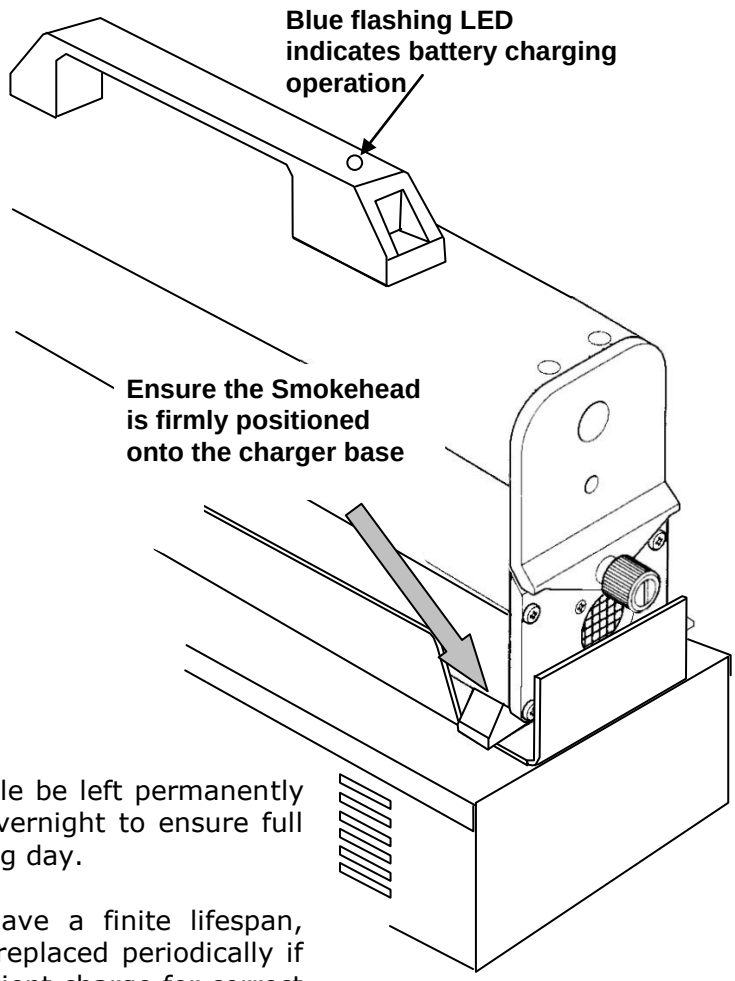
There is a warm-up time of 5 to 20 minutes dependent on the outside temperature. During this time the Smokemeter will not return data to the PC.

NOTE: For details of software controlled procedures, refer to the appropriate software manual.

Wireless Smokehead (DX260-1BT)

For wireless systems the operation of the equipment is identical but a wireless enabled Smokehead (DX260-1BT) using Bluetooth® wireless technology is utilised.

When the equipment is first switched on the smokehead should be firmly positioned onto its charging base and the unit should be allowed to charge for a minimum of five to six hours (or preferably left overnight) to fully charge the batteries.



The equipment screen will prompt the user to return the smokehead to its charging base between tests. This must be obeyed in order to proceed further. Failure to return the smokehead will result in depletion of the battery charge and may result in a shortened lifespan. The test will not continue until the smokehead has been returned.

It is strongly advised that the Charger Cradle be left permanently switched ON with the Smokehead in situ overnight to ensure full operational usage at beginning of the working day.

Please note that rechargeable batteries have a finite lifespan, therefore the battery pack will need to be replaced periodically if the smokehead is no longer sustaining sufficient charge for correct operation. Please contact a Service Engineer through Product Support.

The DX260-1BT wireless Smokehead contains a Multi-Cell Rechargeable Battery designed to give a maximum of 1.5 hours endurance from a full charge.

To recharge, the Smokehead must be correctly located on its charging cradle. The Smokehead must always be replaced on the charging cradle in between tests. This will maximise the battery endurance and is also necessary for test results to be printed.

On the handle of the Smokehead is a highly visible Blue Light emitting Diode (LED). This LED gives indication of the status of the Smokehead whether or not it is on its charging Cradle.

Battery Charging Modes and Endurance:

The nominal endurance of the internal Battery pack is 1.5 hours continuous use from a full charge and cold start. This will vary according to ambient temperature. For optimum use and battery life, the smokehead should be removed from the charging cradle for the minimum amount of time and returned to the charger immediately after testing as prompted by the smoke test Software.

The rate of charging is dependant on a combination of Battery Voltage and Battery Temperature. If the Smokehead has seen reasonable use the charger will switch to 'Fast Charge', taking approximately 1.5 hours to fully recharge. Once full terminal Voltage has been reached, the battery charging rate is reduced to 'Trickle Charge'. When charging for a protracted period, for example overnight, a trickle charge of 15 hours will completely recharge the internal battery. A blue LED on the Handle indicates the Charging Status.

The Blue LED on the Handle of the wireless Smokehead determines the Charging Status. With the wireless Smokehead's charging unit plugged in to a Mains Supply and switched on:

With the Smokehead returned to Charging Cradle:

LED flashing slowly (ON for 1 second, OFF for 1 second): The Smokehead battery is in 'Slow Charge' mode, the charging rate determined by either Terminal Voltage or, Battery Cell temperature.

LED flashing rapidly (2.5 times per second): This shows the Smokehead is in 'Fast Charge' Mode. The battery should be fully charged within 1.5 hours.

LED flashing very rapidly (5 times per second): This indicates that the Smokehead has just been returned to its Charging Cradle and has detected that it is 'On Charge' . **This Status lasts for only a few seconds**.

LED fast Flicker (8 flashes/sec) on returning Smokehead to Charger: Poor contact with charger. Remove Smokehead from charger and replace. If problem persists remove Smokehead, clean all contacts (Smokehead and charger) and ensure the charger pins spring back after compression. If the problem still exists, contact your Helpline.

With the Smokehead removed from Charging Cradle:

LED 'ON' continuously: Smokehead is running on internal Battery.

LED pulsing 'ON' for 2 seconds, 'OFF' for 0.5 seconds: Smokehead battery has reached a Low Voltage condition, and has less than 10 minutes life left before Auto-shutdown.

LED 'OFF': After above Low Voltage condition: Auto Shut down due to Low Voltage. No more testing possible, return Smokehead to Charging Cradle for recharging.

If the Smokehead has received no Communication from Host Computer for over 6 minutes and has gone into 'Sleep' Mode. -- Return the Smokehead to the Charging Unit to invoke a response.

Fault Diagnosis:

Check the Charging Cradle is connected to the 240 V AC Mains. If there are problems encountered with the charging process the following should be observed:

No LED Lit on Smokehead: Return the Smokehead to Charging Cradle. LED should display according to Charging level required.

No LED lit on Smokehead after returning Smokehead to Charging Cradle: Check that the Smokehead is correctly seated on the charging Cradle. The Smokehead has twin connectors on each insulated foot, and may be connected either way round.

Check that the connectors that transmit the Charging Current on the Charging Cradle are clean and not stuck in a depressed condition.

Check that the Charging Connectors on the insulated mounts on underside of the Smokehead are clean and free of dirt and obstructions.

To check the charging Voltage at the Charging Cradle: Connect a Digital Multimeter across the two charging Connectors on the charging Cradle, and depress the Central micro switch. A Voltage of 30 Vdc +/- 0.5v should register on the Multimeter Display.

The internal battery pack has a finite lifespan and will need to be replaced periodically.

SMOKEHEAD MAINTENANCE

The following operations are possible for Field Service on the cabled (DX260-1) and wireless DX260-1BT) Smokeheads.

DX260-1

Function Check
Lens and sample probe cleaning
Power/data cable change/Repair and Plug Change/Repair
Fan and Grill/Filter replacement.
DX260 Interface Box Check

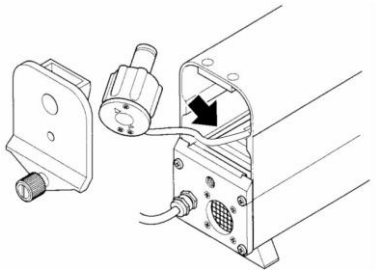
DX260-1BT

Function Check
Lens and sample probe cleaning
Fan and Grill/Filter replacement.
Battery Pack Check and Replacement
Smokehead Charging Contact check/Replacement
Smokehead Charger Voltage check and Contact Replacement.

Any other operations involving the DX260 Smokemeter are outside the scope of this Service Manual and the Smokemeter should be returned to Customer Service for examination. It is recommended that any Smokemeters that are to be bench examined, or repaired are thoroughly cleaned with a proprietary degreaser to remove all external traces of diesel residue as well as garage grime and oil.

Serial numbers

Serial number locations are as follows:



- Smokehead internal - Underneath the lens housing (remove end cap for access).
- Smokehead external – on underside of Smokehead.

CLEANING SAMPLING PROBES

Under normal circumstances the sampling head does not require cleaning.
If a sampling probe becomes restricted with deposits, test results can be affected.

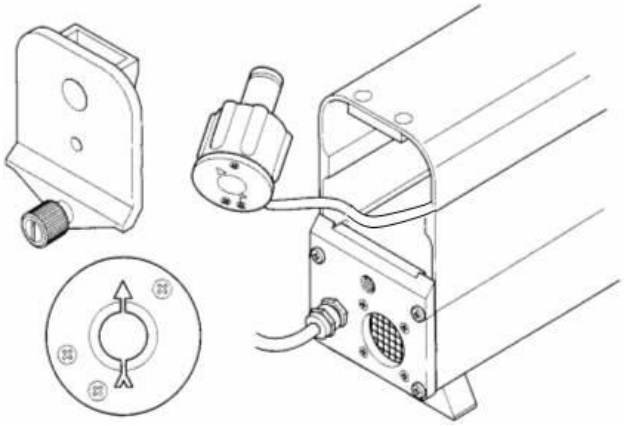
To clean a sampling probe, remove the sample probe from the smokehead. Blow through the sample probe only, using compressed air. DO NOT BLOW THROUGH THE SMOKEHEAD.

CLEANING THE LENSES

Two lenses are fitted in the smokehead, one at either end.

The Smokemeter checks the cleanliness of the lenses at the start of each test, and the PC will provide a warning when cleaning is required.

ACCESSING A LENS



The cleaning procedure is as follows.

1. If fitted, remove the sampling probe.

2. Unscrew the knurled knob at the sampling probe end of the sampling head and remove the end cap.

3. Carefully pull out the lens housing and wipe the lens with a soft cloth (if required, a little methylated spirit will assist cleaning).

4. Refit the lens housing with the arrow pointing upwards (a little silicon grease on the 'O' ring will assist fitment – but do not get on the lens!).

5. Refit the end cap and tighten the knurled knob.
   NOTE: Ensure the end cap locates fully against the body of the sampling head before tightening the knob. If not correctly located, the lens housing is probably not fully home.

6. Clean the lens at the other end of the smokehead in the same way.

   NOTE: The end cap for the sampling probe must be fitted at the end away from the sampling head cable.

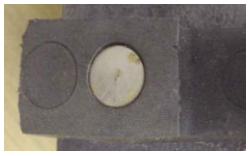
Charging Contact check/Replacement (DX260-1BT only)

Firstly it is important to identify the condition of the contacts and ascertain the likely cause of the contact failure.

To replace the Smokehead contacts carefully follow the procedure below taking care not to lose any washers or spacers used.

Remove both of the end cap plates from the Smokehead by unscrewing the knurled securing screws. Put end cap plates aside.

Using a cross-head Screwdriver remove the 4 screws from the plain end cap plate, and remove the plate. Put the plate and screws aside for reuse.



GOOD The contact has slight wear, but otherwise acceptable.

POOR The contact is slightly corroded through contact with dirt etc. Also small signs of pitting of the plating.

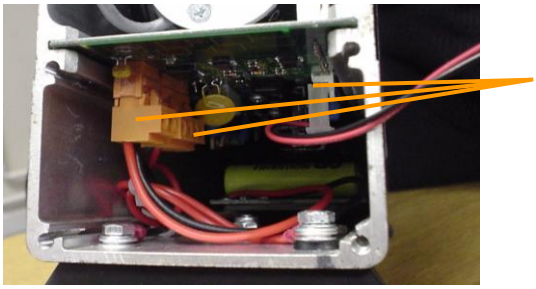
BAD The contact shown left is showing bad signs of arcing and corrosion and should be replaced.

A Service Kit DAS00560 for contact replacement comprises the following components:

M12 Washer	WSHR1086	x 1
Contact block assembly	DAS00553	x 1
Smokehead contacts	DDL00293	x 4

The DDL00293 Smokehead contacts are used for the foot contact replacement. The remaining components are used on the charger base (which should ideally be replaced at the same time).

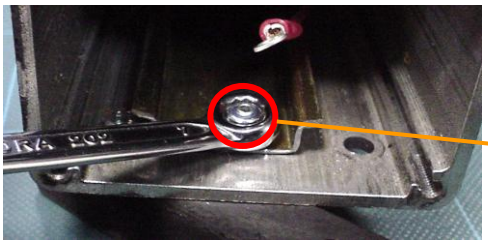
Remove the other end cap plate with the fan by similarly unscrewing the 4 cross-head screws. Carefully remove the fan and end cap, and after noting the way the cables are connected inside the Smokehead, carefully disconnect the red and black fan drive wires by gently pulling downwards on the white Molex connector.



At the Exhaust end of the Smokehead:
Pull the 2-way Fan Cable connector, the 4-way Power/Comms Connector and the battery pack connector downwards to disconnect from the main PCB.

At the Inlet end of the Smokehead:
Pull the Temperature Sensor connector downwards to disconnect.

Use M7 Spanner to release M4x20 Hex bolt. Use Fine nosed pliers to prevent charging contact from rotating with the bolt. Remove bolt, washers and carefully withdraw disconnected battery pack.
Put battery pack safely aside.



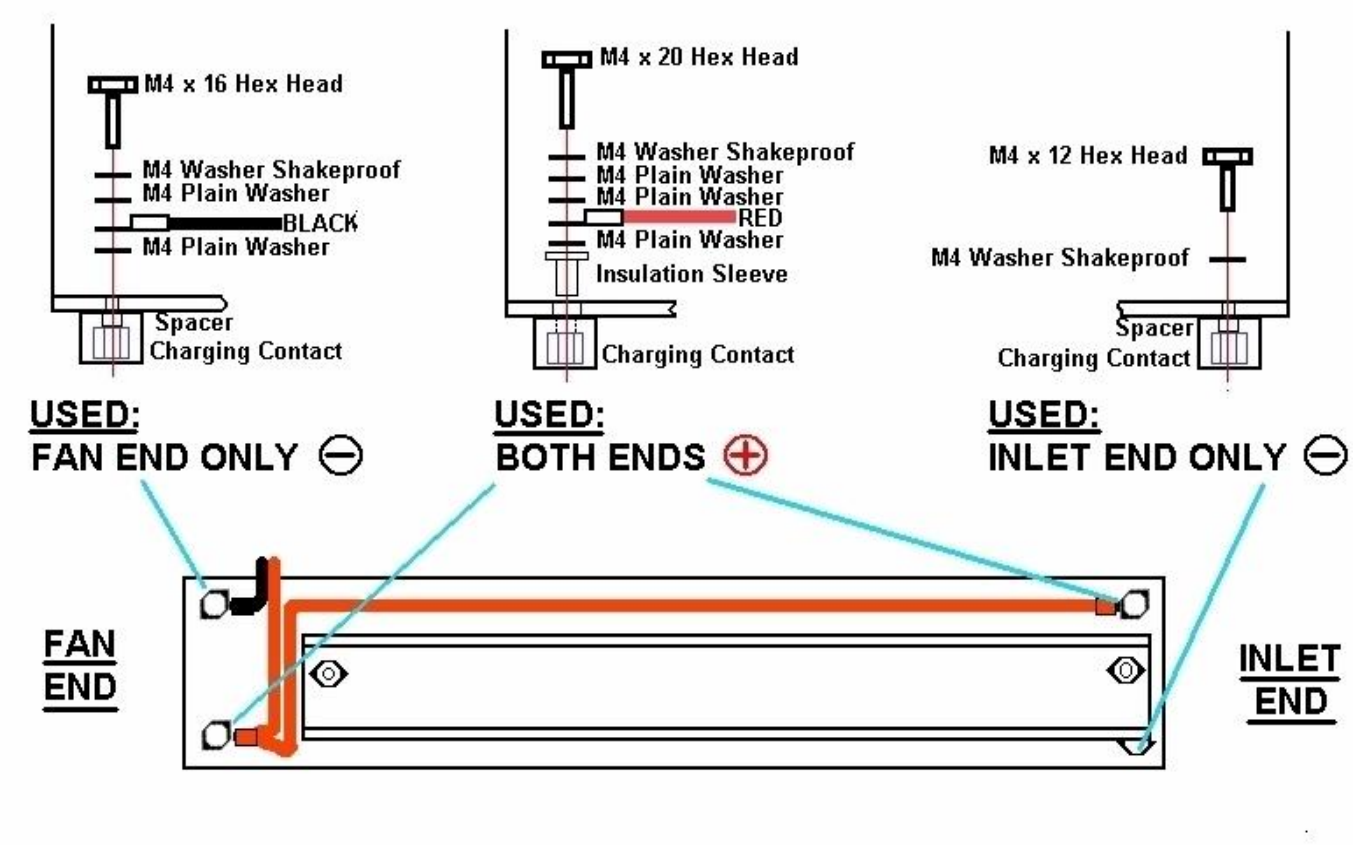
This centre screw and bolt retaining the battery DIN rail must be removed to permit access to the negative or ground terminal. Use a 7mm spanner where necessary to undo the contact retaining bolts and the Din rail nut.

Use fine nosed pliers carefully to grip the flats on the Contacts so that the Hex head bolts retaining the contacts can be undone with a 7mm spanner as shown.

The reassembly of the new Smokehead contacts into the rubber feet is the reverse of dismantling. Care must be taken to include the small cylindrical metal spacer in the Negative terminal Rubber Feet.

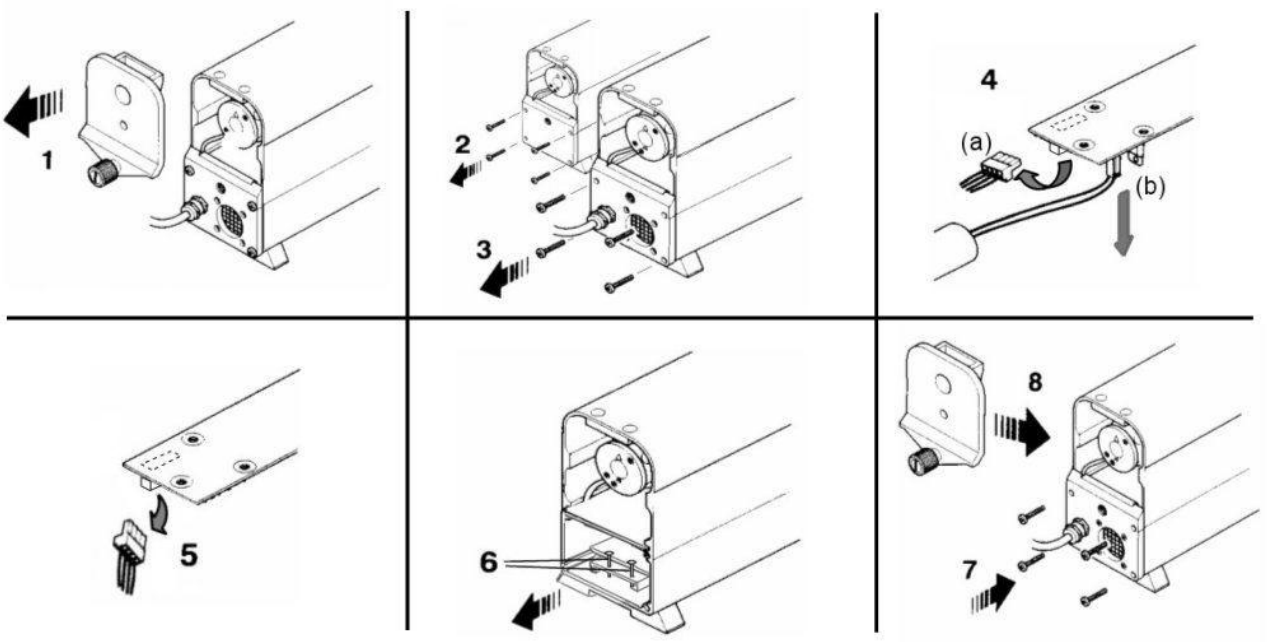
Ideally, lightly lubricate the four charger contacts with WD40 or light oil to prevent corrosion.

DDL00293 Charging contacts are used for the Smokehead foot contact replacement – quantity 4 per Smokehead



After dis-assembly and re-assembly of the smokehead charging contact assembly a full continuity check should be carried out to ensure connectivity and short-circuit prevention.

SMOKEHEAD CABLE RENEWAL/FAN Replacement



Should the cable become damaged and require renewal, the procedure is as follows.

1. Unscrew the knurled knob (1) and remove the end cap.

2. Remove the four countersunk screws (2) which secure the internal fan and grille to the smokehead end plate.

3. Remove the four panhead screws (3) securing the end plate and carefully ease the plate clear of the housing.

4. Disconnect the 4-pin plug (4a). If carrying out a fan replacement disconnect the 2-pin plug (4b) and replace the fan. Carefully fit the fan and fan grille to the end plate (4 countersunk screws).

5. Remove the 4 wires from the 4-way plug. Undo the metal cable clamp from the end plate. Loosen the cable gland strain relief and remove the cable from the end plate.

6. Re-fit the new cable through the cable gland strain relief and secure to the end plate with the metal clamp (Important: secure the clamp on the earth braid of the cable). Re-fit the 4-way plug. Ensure the cable gland strain relief is tightened.

7. Connect the 4-pin plug (4a) and the 2-pin plug (4b).

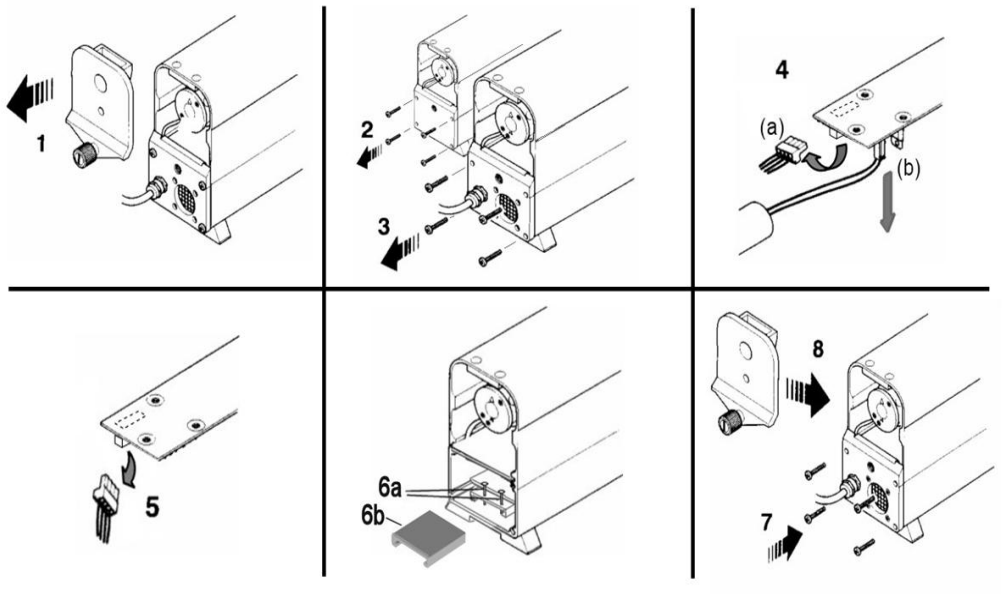
8. Locate the end plate to the smokehead (cable on left hand side) and loosely secure with the four panhead screws.

9. Check that the lens housing is fully in, then fit the end cap and secure with the knurled knob. Fully tighten the knurled knob then slacken half a turn.

10. Push the end plate upwards as far as it will go, and then fully tighten the 4 panhead screws.

11. Fully tighten the knurled knob on the end cap.

SMOKEHEAD BATTERY REPLACEMENT (DX260-1BT only)



Should the battery pack require renewal, the procedure is as follows.

1. Unscrew the knurled knob (1) and open up both end caps.

2. Remove the four panhead screws (2) & (3) securing the end plates and carefully ease the plates clear of the housing.

3. At the fan end, disconnect the 2-pin plug (4a) and also the 2-pin plug (4b) connected to the fan.

4. At the probe end, disconnect the 3-pin plug (5).

5. Depending on which version - loosen the two screws (6a) or the plastic spacer (6b) securing the battery pack and remove old battery pack, do not remove by pulling the cables. Ensure the connectors do not foul any components during removal/replacement of the board.

6. Replace with new battery pack (note orientation). Discard the two securing screws (earlier versions) or the plastic spacer (later versions) – no longer required.

7. Re-connect the 2-pin plug (4a), the 2-pin plug (4b) and the 3-pin plug (5).

8. Relocate the end plates to the smokehead and loosely secure with 4 panhead screws (7).

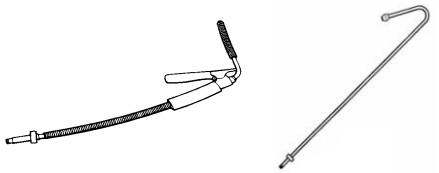
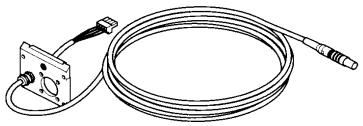
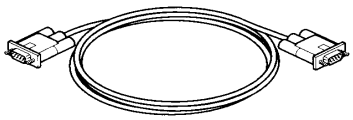
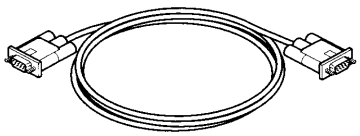
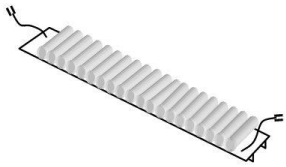
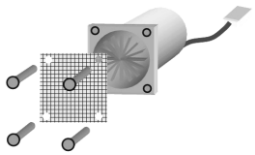
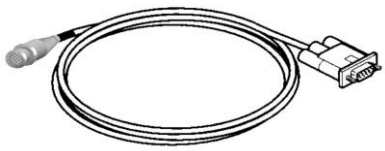
9. Check that the lens housing is fully in, then fit the end caps and secure with the knurled knob. Fully tighten the knurled knob then slacken half a turn (8).

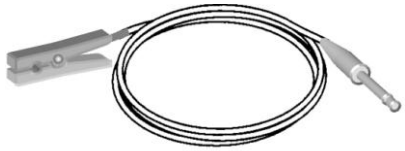
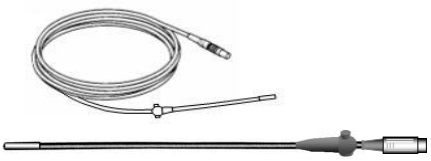
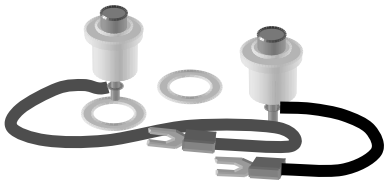
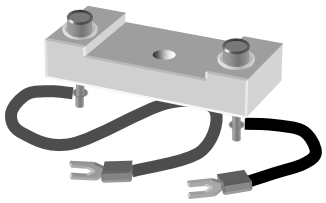
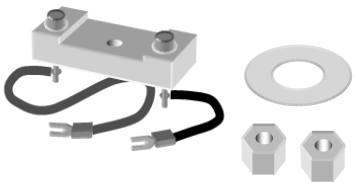
10. Push the end plate upwards as far as it will go, and then fully tighten the 4 panhead screws.

11. Fully tighten the knurled knob on the end caps.

NOTE: Ensure the battery is disposed of in accordance with current rules and regulations applicable and enforced in your area. When the equipment is first switched on the Smokehead should be firmly positioned onto its charging base and the unit should be allowed to charge for a minimum of five to six hours (or preferably left overnight) to fully charge the batteries.

OPTIONAL EQUIPMENT & CONSUMABLES

	**DX210-4A** **Sampling probe (**Standard) **DX210-4A-L** **Sampling probe** (Large) For large aperture exhausts (>70mm) **DX210-6** **Sampling pipe** (Standard) For vertical stack exhausts **DX210-6L** **Sampling pipe** (Standard) For large vertical stack exhausts (>70mm)
	**Cable** – Smokehead Cable Assembly **DAS00497** 10m Standard **DAS00559** 0.6m (Use with AS09188 Interface Module)
	**Cable** – Interface to PC, Serial Null Modem 2m **DX230-261** 9 way D (Female to Female)
	**Cable** – Serial comms cable from PC to VOSA Smartcard reader (UK only). **AS08804** (Note: May already be fitted if host PC has EGA)
	**DX260-1BT/01 Battery Pack** (For use with DX260-1BT Head only)
	**DX230-130/16 Fan Kit** (Replacement fan for DX260-1 & DX260-1BT)
	**Tacho Comms Cable** **AS09133** 5m Standard (for CDSS1) **DX230-261** 2m Standard (for CDSS4, CDSS6)
	Battery Tacho Power/Sensing cable **CABL3016** CDSS3/4/6 to vehicle battery
	Battery Tacho Power/Sensing Cable **CABL3023** CDSS3/4/6 to vehicle accessory socket

	**Inductive RPM Clamp** **HTP3** For use with CDSS3/CDSS5
	**Oil Temperature Probes** **TRDU0127** Use with CDSS4/CDSS4BT only (5m cable) **DX210-25A** 2.5m (Use with DX211-11 or DX211-11BT) **DX210-26** 0.75m (Use with DX211-11 or DX211-11BT)
	Temperature Probe Adapters (use with DX210-25A and DX210-26 probes) **DX211-11** – 5m cabled Adapter **DX211-11BT** – Wireless Probe Adapter
	Power Supplies **PWRS0031** – 30v (use with wireless smokehead only) **PWRS0035** – 24v (use with cabled smokehead only)
	Smokehead Diagnostic Kit (Use with all Smokeheads) **DX260-DIAGKIT** – Software included
	**Contact Block Kit** (use DX260-1CHP Smokehead Charging Base) **AS09662** Pre-wired
	**Contact Block Assembly** (use on Cabinet mounted Smokehead charger) **DAS00553** Pre-wired
	**Contact Replacement Kit** (use on Smokehead feet & Smokehead charger) **DAS00560** Pre-wired kit **DDL002963** Smokehead foot contacts **(**Sold individually)

EQUIPMENT CONFIGURATION

From the Platform Configurator screen of the host PC you can configure all peripheral devices either as 'Wired' or 'Wireless'. To configure/re-configure or verify all peripheral equipment to the host computer the following configuration procedure should be followed:

Configuring or Checking cabled device settings

Minimize the main program and from the 'Start' menu select the following:
Start/Programs/Dieseltune (or Crypton)/Platform Configuration/Platform Configuration Utility

For each wired device selected ensure that the 'Wired' button is checked and the correct port identification entered in the 'Port' entry box. Select 'Save' then 'Exit.

Configuring or Checking wireless device Settings

The Bluetooth® devices communicate to a controlling Personal Computer using Bluetooth® wireless technology. The configuration of the Bluetooth® wireless link will need to be verified and changed if a replacement device is fitted to an existing Smokemeter system.

To verify the Bluetooth settings of the Smokehead, and if supplied, Temperature Probe, Test Progression Handset or the wireless Battery Tachometer/EOBD unit, or maybe to change the settings if replacement devices are fitted, the following configuration procedure should be followed:

The Bluetooth ID (BTID) will need to be entered in the program.
The Bluetooth® devices communicate to a controlling Personal Computer using Bluetooth® wireless technology. The configuration of the Bluetooth® wireless link will need to be verified and changed if a replacement device is fitted to an existing Smokemeter system.

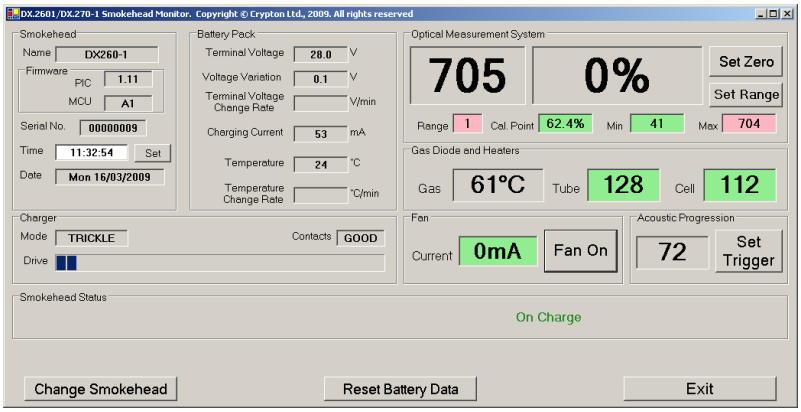
Minimize the main program and from the 'Start' menu select the following:
Start/Programs/Dieseltune (or Crypton)/Platform Configuration/Platform Configuration Utility
Select the device to be configured. Ensure 'Wireless' is checked.

Enter the Bluetooth ID for the device in the 'Bluetooth Address' box. This address is a 16-character string identified on the device serial label.

Select 'Save' and 'Exit'.

SMOKEHEAD DIAGNOSTICS

Testing of the Crypton/Dieseltune DX series of Digital Smokehead is done using the PSA80533 Smokehead monitor program a DX.260 Diagkit test kit.



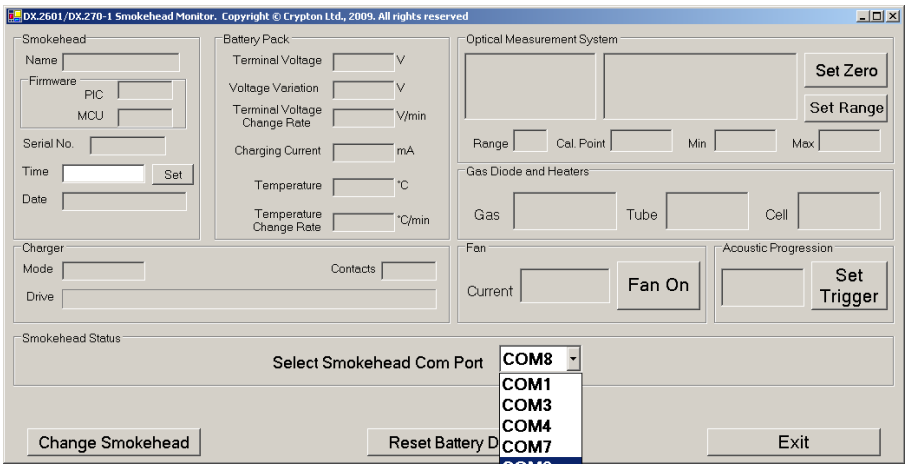
Software Requirements

- PC with at least one serial port or USB-Serial port adapter.
- 32 Bit Microsoft® Windows operating system[1]
- Microsoft® .NET® Framework 1.1 or higher[2]
- For wireless units, a *Bluetooth*® Software Stack that supports Virtual COM ports with no compulsory pairing (e.g. WIDCOMM, Toshiba but not Microsoft®)[3]

Operation

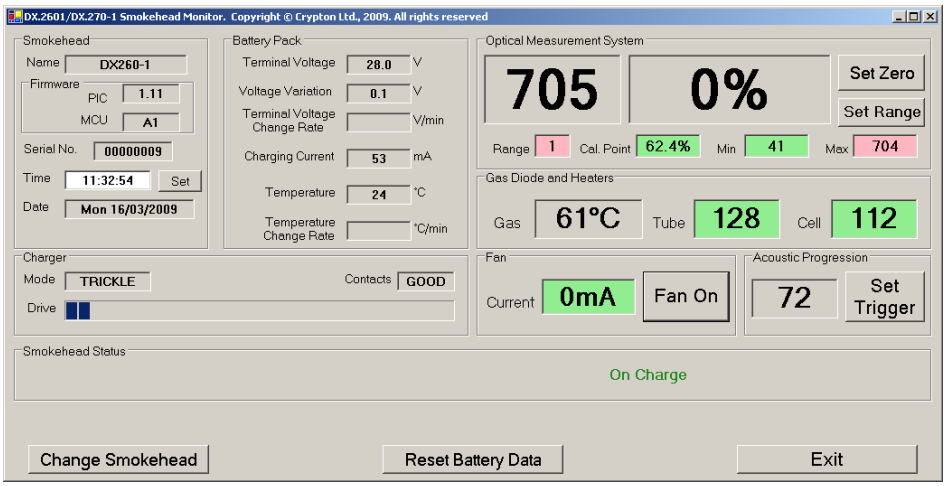
The software (a single executable) does not have to be installed and can be run from a memory stick or network share (with appropriate permissions)

When the program is started, it will present a dialog box similar to that shown below.



Ensure the smokehead is powered and connected, then select the COM port[4] using the drop-down list. The test software will immediately try to connect to the smokehead and, if successful, will display information and readings similar to those shown below.

1. All trademarks are acknowledged
2. .NET v2.0 redistributable installation package (dotnetfx.exe) is included on the PSA80533 medium
3. This issue will be addressed in later versions of the software.
4. For wireless units, you must first connect the smokehead to a virtual COM port. Consult your *Bluetooth* module documentation for instructions. The Smokehead *Bluetooth* address by which it may be identified is printed on the serial number label. Note that pairing is not supported by the smokehead.

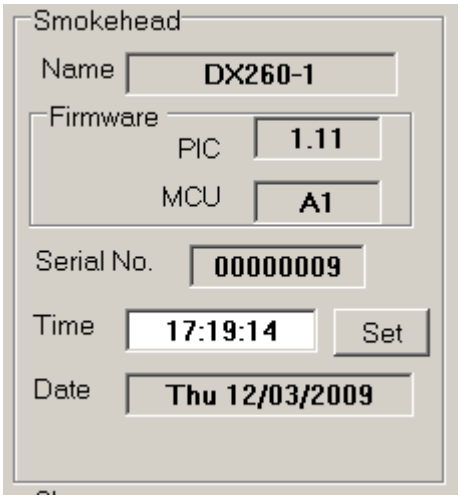


Basic smokehead information

The basic smokehead information appears in the Smokehead group.

For example, with a Dieseltune UK smokehead:

- The name is shown as DX260-1
- The PIC Firmware is shown as 1.11
- The MCU Firmware is shown as A2



The serial number should match the label

The Time will be updating. Set the time, if necessary, by clicking in the box. The time will then stop updating and the new time may be entered. Press the Set button to update the smokehead real time clock.

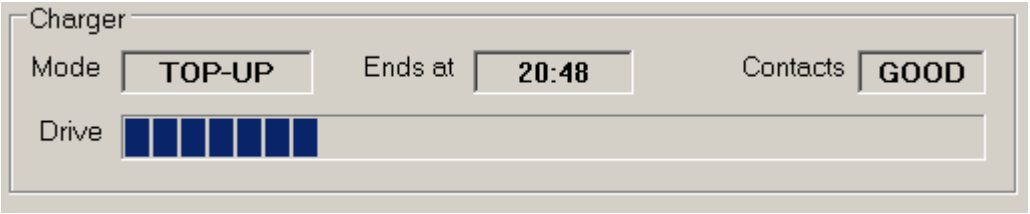
If the Time box has been clicked in accidentally, clear the box & press set. The updating current time will then re-appear.

The date cannot be altered using this program. Note that it is in UK format i.e. dd/mm/yyyy

If the smokehead RTC chip has suffered a power loss, the phrase "Time and Date Invalid" will appear below the date. This will disappear when the time is set.

Charger[5]

The Charger group shows the current state of the battery pack charging system.



Mode

The charger has six modes of operation. These are:

- Off – Smokehead is not on charging cradle or charger power is off
- On – Smokehead is on the charging cradle and is determining the optimum charging mode
- Fast – Smokehead is fast charging the battery pack. The Fast Charge mode will finish within 90 minutes as indicated by the 'Ends in' value displayed or earlier if the Battery Pack terminal voltage exceeds 28.5V or if the Battery pack temperature rise is excessive.
- Slow – Smokehead is charging the battery pack at the 15 hour rate. The time at which it is due to finish is as indicated in the 'Ends at' value displayed. It will, however, terminate earlier if the Battery Pack terminal voltage exceeds 28.5V
- Top-Up – The Fast charge does not fully charge the battery pack so a subsequent period of up to 4 hours at the 15 hour rate is used to top-up the charge. The time at which it is due to finish is as indicated in the 'Ends at' value displayed. It will, however, terminate earlier if the Battery Pack terminal voltage exceeds 28.5V
- Trickle – Smokehead is charging at a very low rate to maintain the Battery Pack in its fully charged state. The mode follows the termination of Top-Up or Slow charging modes

Drive

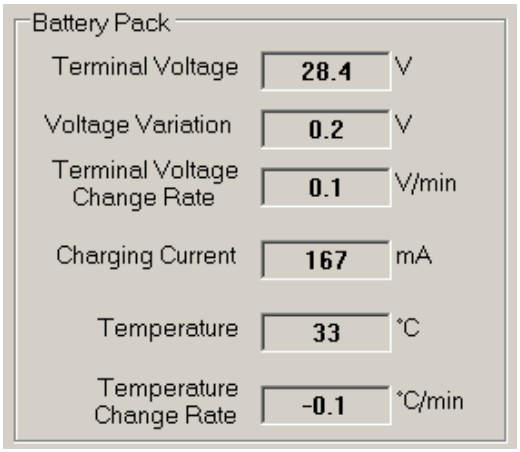
The Drive bar gives an indication of the charging current control setting required to achieve the optimum current for the mode. As the Battery Pack terminal voltage increases, the control is set higher to maintain the current at a constant level. When the charging mode changes, the drive is adjusted to set the new current.

Contacts

In the event that the charging contacts become pitted, corroded or loose, the presence of the charger may be detected but little or no charging current flow in spite of maximum drive setting. This condition causes the Contacts display to change from 'GOOD' to 'POOR'. Since all smokehead boards are 'wireless ready', this may also be displayed on wired smokeheads.

5. The Charger group applies only to battery operated, wireless smokeheads and has no significance with wired smokeheads.

Battery Pack[6]



The Battery Pack group gives information on the state of the rechargeable battery pack within the previous 60 seconds.

Due to the continuous smokehead heater switching, the values are heavily filtered thus the effect of charging mode changes will take a while to be visible.

Terminal Voltage

The battery pack terminal voltage gives an indication of the state of charge of the Battery Pack

Voltage Variation

This shows the difference in terminal voltage caused by the switching of the heater current or a change of charging mode. Its purpose is to estimate the internal resistance of the battery pack which increases with time and charge cycling. When the pack has been fully charged and the Smokehead at operating temperature, remove the smokehead from the charging cradle. Let the smokehead stand for 30 seconds, then turn on the fan (see below) and press the "Reset Battery Data" button. A Voltage Variation reading of more that 2 Volts within 30 seconds indicates a suspect battery pack.

Terminal Voltage Change Rate

This give an indication of the Battery Pack internal resistance to charging but is less reliable that the voltage variation.

Charging Current

This shows median value of up to 60 readings of the charging current and provides a means of checking that the charger is operating correctly.

Temperature

This reading shows the temperature of the cells in the battery pack. The cell temperature is important for determining the optimum charging mode. The range of the reading is from 1°C to 60°C (approx)

Temperature Change Rate

This reading shows the heating effect of the current during charging and discharging. A rate of temperature rise of more than 1°C per minute for 3 consecutive minutes is used to terminate Fast charging mode early.

6. The Battery Pack Group and the "Reset Battery Data" button at the bottom of the dialog box, apply only to battery operated, wireless smokeheads and have no significance with wired smokeheads.

Gas Diode and Heaters

For smokehead calibration purposes, the heaters must be operating at the normal measurement levels. This is especially important when selecting the Photodiode amplifier gain 'Select On Test' (S.O.T) resistor. When the heaters are running at the correct level, the background colour will be Green

The forward voltage drop of the Gas Diode has been accurately measured at 50°C and is written on the measurement tube assembly outer plastic tube. The Gas Temperature calibration is set by the 10-turn potentiometer (R65) using a calibrated voltmeter accurate to 1mV and the supplied DX.260 DIAGKIT Calibration Box.

To calibrate the Gas Temperature Sensor Diode:

1. Unplug the 2-way lead coming from tube assembly from the 9-way heater connector and connect the 2-way lead from calibration box.

2. Adjust the 10 turn resistor on the test box for the meter reading written on the tube assembly (e.g. .677 = 677mV).

3. Adjust the 10 turn potentiometer on the smokehead board (R65) for 50°C Gas reading (Green background colour). Ensure meter reading has not changed; adjust and repeat as required.

4. Unplug the calibration box & reconnect the Gas Diode lead from the tube assembly.

Optical Measurement System

The Optical Measurement System group shows a number of parameters. To assist with setting up & calibration, background colour has been used to highlight in-spec and out-of-spec conditions on relevant readings.

Live Reading

This is the raw, unfiltered reading from the optical system. When selecting the Photodiode amplifier S.O.T. Resistor, the background will be Green for optimal resistor values.

Percent Obscuration

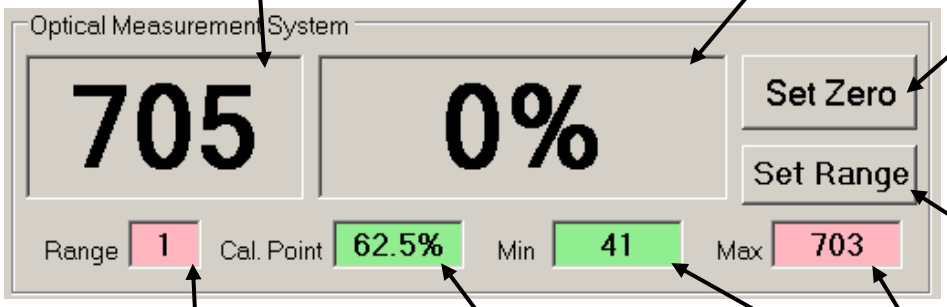
This is the raw, unfiltered obscuration calculated from the Live readings and the Min & Max values. It is for use with Neutral Density Filters of known transmission factors to check the system linearity.

Set Zero

Resets the Min. Max. and the Cal. Point values.

Set Range

Resets the LED Drive. The Live reading may drift for a time after range setting so the Set Zero button is disabled for 10 seconds.



LED Drive range

This is the LED brightness which is set to compensate for soot build-up on the lenses. For new unit calibration purposes, it must be 0.

Auto-calibration check

This is the result of the patented self calibration calculation. It should be 62.5% ± 3%. Correct values are shown on a Green background.

Optical Reading Range

The Min. and Max readings are the basis of the calibration and Percent Obscuration calculations

Min. should be <61, Max. = 770 to 975

Correct values are shown on a Green background.

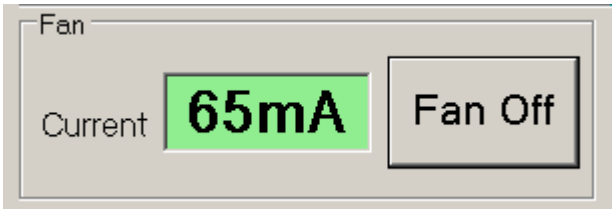
If the Photodiode and/or LED cell has been replaced, it may be necessary to change the S.O.T resistor (R7). This is facilitated using a DX.260DIAGKIT Calibration Box

To select the optimum resistor:

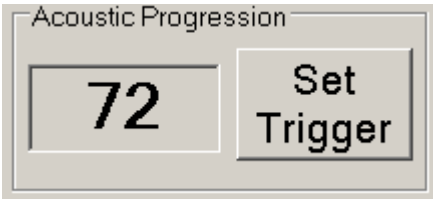
1. Ensure the heater readings are normal and stable.
2. Remove the existing S.O.T resistor.
3. Set the LED Drive range using the 'Set Range' button. Ensure the Range is Zero (Green background).
4. Connect the crocodile clips from the DX.260 DIAGKIT Calibration Box across the resistor fitment posts and dial-up successive resistor values using the rotary switches until the Live Reading background goes Green
5. Fit a fixed resistor of the value indicated by the DX.260 DIAGKIT Calibration Box Label.

Fan Operation

The fan can be operated and the current checked. Acceptable current levels (whether On or Off) are shown on a Green background, incorrect values on a Pink background. Note that the start-up current may be high enough to cause a brief Pink background; this is acceptable.



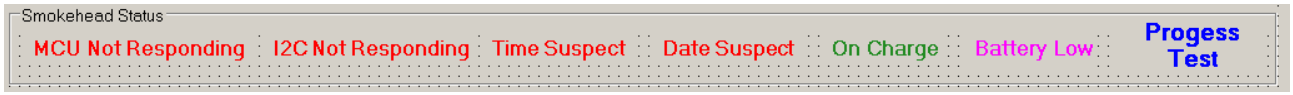
Adaptive Acoustic Progression



The Acoustic Progression system can be exercised. When the smokehead first connects, the Current Threshold reading has the default background.
Clicking the "Set Trigger" button causes the Automatic Setting procedure to start. If no trigger is obtained, the background colour will turn Blue and the smokehead will set the Threshold to 72. If the system could not clear a trigger (e.g. too much noise, incorrect microphone wiring or circuit failure), the background colour will turn Pink and the smokehead will set the Threshold to 72. All other conditions will show the threshold set by the system on a Green background

Smokehead Status

The Smokehead Status area shows the live state of the Smokehead as returned by the "Get Status" command. The Messages shown below represent (from left to right) bits 0 to 6 of the Status Byte. Under normal operation, "On Charge" (always on a wired unit) and, occasionally, "Battery Low" (even on a wired unit) will be seen. "Progress Test" will show for a period when the Acoustic Progression Trigger Threshold is exceeded.



"Time Suspect" and "Date Suspect" may be seen if the Real Time Clock has lost power (see Basic Information) or if the Time and/or Date have been corrupted. They may be cleared by setting the time and date then power cycling the Smokehead.
"MCU Not Responding" and "I2C Not Responding" indicate hardware problems and should never be seen.

Program Status

A program status area exists between the Smokehead Status and the bottom row of buttons. Messages that may be seen there include "Connecting to smokehead", "Connecting - Please wait...." and "The smokehead is not responding". With the latter, check that the correct COM port number was selected and the Smokehead is both connected to it and powered. If the wrong port was selected, exit the software and restart it.

Buttons

The "Change Smokehead" button should be used when you wish to disconnect one smokehead and test another (on the same COM port).
Clicking it sends a "Power Down" command to the Smokehead (turning off the Optical Measurement System & heaters), closes the COM port and clears all the data from dialog box.

The button legend then changes as shown.[7]

The "Reset Battery Data" clears the accumulated data used to generate the Battery Pack group display (see Battery section above). It is of no relevance to wired smokeheads.

The "Exit" Button sends a "Fan Off" command, closes the COM port and exits the program. It does NOT send the "Power Down" command

7. For wireless units, you must first connect the desired smokehead to the previously allocated virtual COM port before pressing the 'Connect Smokehead' button. Note that pairing is not supported by the smokehead.

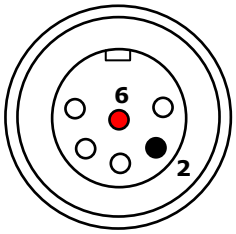
DX260-1IFP INTERFACE BASE (cabled Smokehead)

The interface power base supplies power for the cabled smokehead. The power supply is non-adjustable and has a fixed output of 24v. (On earlier models the power supply is adjustable with its output set at 24V +/-0.2V DC. For adjustment of replacement of this power supply follow instructions as for DX260-1CHP).

The DX260-1IFP Interface Base also relays wired communication from the DX260-1 cabled smokehead to the controlling PC through an RS232C connection.

The Power Supply providing the 24V can be easily checked for the correct output voltage at the smokehead end, where PL2 4Way connector, Red to Black should provide a minimum 24.0V DC. There will be a voltage drop along the cable which is normally 10m in length. Maximum current demand from the power supply will be approximately 2.3A at 24V DC. Maximum current demand is usually on start up from cold as the tube and optic heaters pull maximum current to achieve an over-temperature condition prior to cooling to their specified temperatures.

To check the Output Voltage of the DX260-1IFP:
Unplug the DX260-1 smokemeter, and power up the interface power base unit:



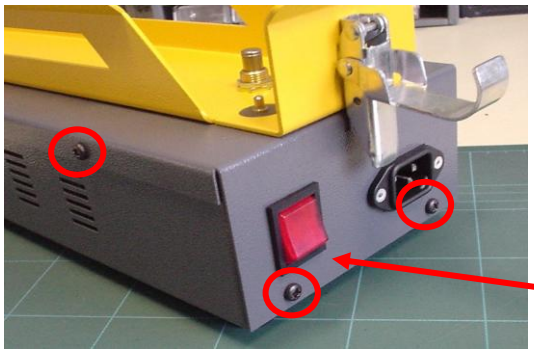
Using a Digital Multimeter (DMM) set to measure 30V DC , with the Negative probe connected to Pin 2 (black) and the Positive Probe to Pin 6 (red): The measured Voltage with the unit powered up should be 24V DC.

Picture left shows external view of DX260-1 Smokehead Socket.

Power Supply failure and replacement:

Before carrying out any work within the DX260-1IFP Interface Base - firstly ensure that all external connections are removed – in particular the Mains Power Input.

Remove the 8 cross-head screws securing the lid to the base, remove the lid section from the base, and turn it over so that the power supply and associated wiring is revealed.



Remove using a cross-head screwdriver the 8 screws securing the smokehead holder to the Base:

2 screws at each end (as shown)

2 screws at each side (1 shown)

Illuminated ON/OFF SWITCH

Disconnect the mains power connector from the power supply, then unplug the 2.1mm power connector from the secured socket. The power supply can now be carefully removed from the base by pulling up and away from its securing pad.

Re-fit with the replacement power supply unit and re-make its connections.

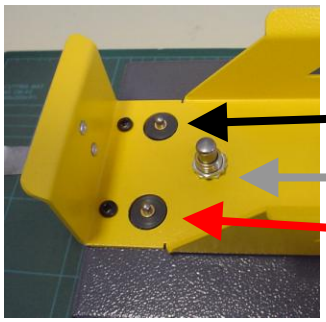
Refit the smokehead cradle top to the base with the 8 cross-head screws.
Finally, reconnect mains power lead and enable power to the DX260-1IFP Interface Power Base.
Test for correct output Voltage at the Smokehead socket as previously described.

If the correct Voltage is present, reconnect the Smokehead. Check that the external metalwork is earthed.

DX260-1CHP CHARGER BASE (wireless Smokehead)

Testing the DX260-1CHP

The unit can be tested by measuring the output voltage at the charger pins whilst pressing the centrally mounted micro switch down.



A Digital Multimeter (DMM) set to measure 30V DC should be used and the probes connected as shown:

Multimeter NEGATIVE Probe

Microswitch

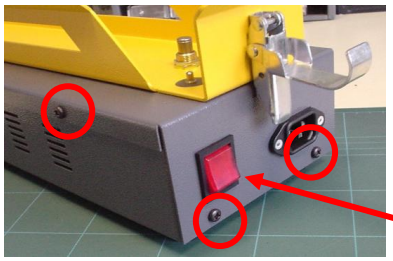
Multimeter POSITIVE Probe

The **Voltage across the Pins** should be 30.0 V +/- 0.5V dc

If the Voltage is within the above range, then no adjustment of the internal power supply Voltage is necessary.

Adjusting the DX260-1CHP Charger Output Voltage

⚠ Before carrying out any work within the DX260-1CHP Charger Base - firstly ensure that all external connections are removed – in particular the Mains Power Input.



Remove using a cross-head screwdriver the 8 screws securing the smokehead holder to the Base:

2 screws at each end (as shown)

2 screws at each side (1 shown)

Illuminated ON/OFF SWITCH

An insulated trimming tool is required to adjust the internal power supply output voltage potentiometer.

A Digital Multimeter set to read 30V DC should be connected across the + Red and – Black output voltage terminals of the power supply.

Check that the spring-loaded connectors are clean and not stuck in a depressed condition. Also check that the crimp connections to the switch and mains IEC connector are secure.

The mains 240V should be connected and the charger switched on at the red On/Off switch shown previously. The voltage displayed on the Digital Multimeter should be 30.0V +/- 0.5V DC. Adjust the potentiometer carefully clockwise to increase the Voltage, and anti-clockwise to reduce.

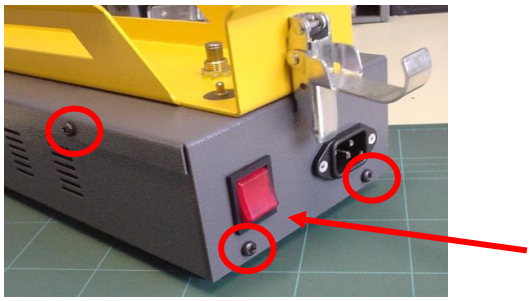
Switch off power at the switch and remove the power input cable. Reassemble the charger Unit, refitting the charger cradle to the base, and replacing the 8 cross-head screws. Reconnect the charger unit to the local mains power, switch the charger ON, and retest the output charging voltage by connecting the DMM across the Positive and Negative charging Pins, and depressing the central micro switch. Check that the DMM displays 30.0V +/-0.5V DC

Check that the charging connectors on the underside of the Smokehead feet are clean and free of dirt and obstructions. Check that the external metalwork is earthed.

Power Supply failure and replacement:

Before carrying out any work within the DX260-1CHP Charger Base - firstly ensure that external connections are removed – in particular the Mains Power Input.

Remove Charging Base cover as described in previous section: 'Adjusting the DX260-1CHP Charger output voltage'.



Remove using a cross-head screwdriver the 8 screws securing the smokehead holder to the Base:

2 screws at each end (as shown)

2 screws at each side (1 shown)

Illuminated ON/OFF SWITCH

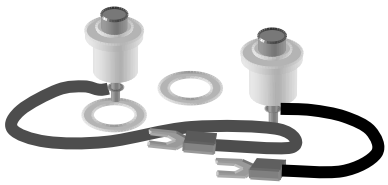
If faulty the power supply is non-repairable and should be replaced:
Remove the cables from the power supply noting their positioning. Remove the securing screws on the underside of the power supply and remove the unit. Replace the power supply and affix using securing screws. Re-affix the wires to their correct locations. Reassemble the Mains Chassis Assembly to the cabinet and re-affix the smokehead bracket.

Charging contacts failure and replacement:

Before carrying out any work within the DX260-1CHP Charger Base - firstly ensure that all external connections are removed – in particular the Mains Power Input.

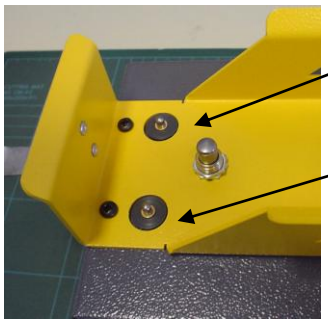
Charger base contact replacement will be required if the contacts have become severely corroded. Corrosion will occur if arcing has been taking place due to incorrect microswitch adjustment or can be a result of the contacts becoming dirty from contaminants and debris picked up from the workshop floor. Restricted movement of the contacts may also occur as a result of dirt or excessive heat from arcing.

The contacts are replaced as a kit (AS09662) comprising two contact block assemblies. Access to the contact blocks can be achieved by removing the cover on the Charging Base.



Remove the push-on retainers securing the contact blocks and pull out the blocks from the metal assembly. The contact block with the red lead is connected to the microswitch. Disconnect this red lead at the microswitch. The contact block with the black lead is connected to the power supply –V output. Disconnect this black lead at the power supply.

Discard the old contact blocks and re-assemble the replacement contact blocks to the metalwork using the supplied push-on retainers and ensure there is free movement of the spring contacts (uninhibited by wire positioning).



Re-connect the red lead to the microswitch and the black lead to the power supply –V.

Re-assemble all parts and covers. Re-connect the mains power supply and check the presence of 30Vdc +/- 0.2V at the pin contacts when the microswitch is operated. Check that the external metalwork is earthed.

Adjusting the Microswitch

Charger base microswitch height adjustment should be set so that the microswitch (Fig. 1) is heard to operate when the smokehead foot is between 1-2mm from the charging base (Fig. 2). If the microswitch is set to operate at a too high a setting then arcing of the charging contacts will occur. If it is set too low then it may fail to activate. Access to the microswitch is achieved by removing the Charger Base cover.

Before carrying out any work within the DX260-1CHP Charger Base - firstly ensure that all external connections are removed – in particular the Mains Power Input.

The microswitch height should be adjusted to the correct height by removing the microswitch retaining nut, dropping the microswitch away from the chassis and inserting an M12 washer (WSHR1086) between the microswitch and the cradle (Fig. 3). Re-fit the microswitch with its retaining nuts, re-fit the Charger Base cover and check for correct operational height using a Smokehead.

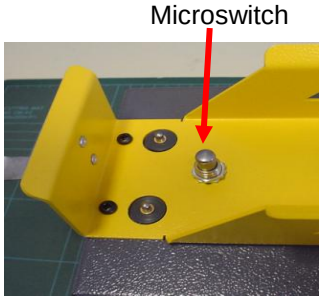


Fig. 1

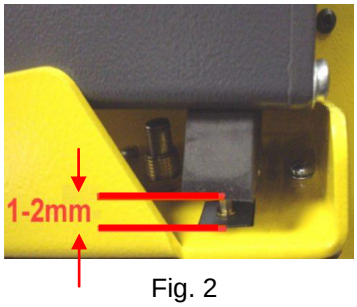


Fig. 2

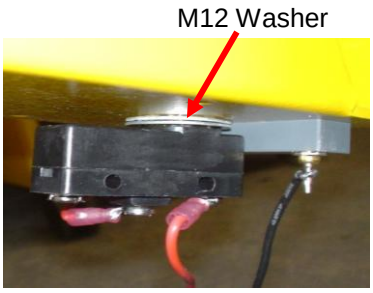


Fig. 3

CABINET MOUNTED POWER SUPPLIES

On some equipment the wired DX260-1 Smokehead is powered directly from the cabinet Mains Chassis Assembly or the wireless DX260-1BT Smokehead may be charged from the cabinet mounted charging cradle assembly.

Power Supply replacement (cabled systems):

Before carrying out any work within the cabinet - firstly ensure that all external connections are removed – in particular the Mains Power Input.

To replace the internal power supply it will be necessary to open the Mains Chassis Assembly located inside the cabinet. To remove the Mains Chassis Assembly first ensure that mains power is switched off and the power lead disconnected from the equipment. Remove the three securing screws that hold the smokehead bracket to the cabinet and discard the bracket. Remove the fourth screw next to the bracket to release the Mains Chassis Assembly from the cabinet. From inside the cabinet remove all connecting leads to the Mains Chassis Assembly then remove the unit from the rear of the cabinet. The Smokehead power supply will now be accessible.

Disconnect the mains power connector from the power supply, then unplug the 2.1mm power connector from the secured socket. The power supply can now be carefully removed from the base by pulling up and away from its securing pad. Re-fit with the replacement power supply unit and re-make its connections. Reassemble the Mains Chassis Assembly to the cabinet and re-affix the smokehead bracket.

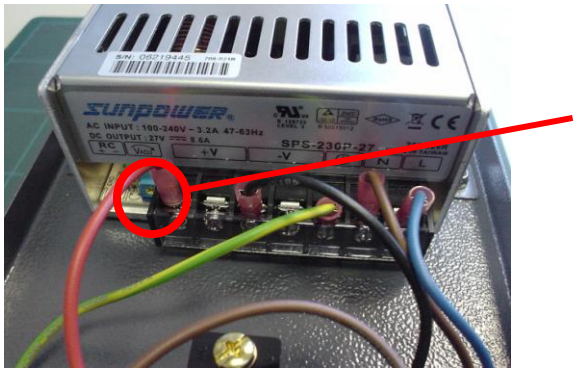
For newer wired systems the power supply is not adjustable. It is also a non-repairable item and should be replaced if it becomes faulty.

Power Supply adjustment or replacement (wireless systems):

Before carrying out any work within the cabinet - firstly ensure that all external connections are removed – in particular the Mains Power Input.

To adjust the internal power supply voltage, it will be necessary to open the Mains Chassis Assembly located inside the cabinet. To remove the Mains Chassis Assembly first ensure that mains power is switched off and the power lead disconnected from the equipment. Remove the three securing screws that hold the smokehead charging cradle to the cabinet and remove the cradle.

Remove the fourth screw next to the bracket to release the Mains Chassis Assembly from the cabinet. From inside the cabinet remove all connecting leads to the Mains Chassis Assembly then remove the unit from the rear of the cabinet. The Smokehead power supply will now be accessible:



An insulated trimming tool is required to adjust the internal power supply output voltage potentiometer.

A Digital Multimeter set to read 30V DC should be connected across the + Red and – Black output voltage terminals of the power supply.

Check that the connectors that transmit the charging current on the charging cradle are clean and not stuck in a depressed condition. Also check that the crimp connections to the switch and mains IEC connector are secure.

The mains 240V should be re-connected and the charger switched on – IMPORTANT – BE VERY CAREFUL - MAINS VOLTAGES PRESENT. The voltage displayed on the Digital Multimeter should be set to 30.0V +/- 0.5V DC. Adjust the potentiometer carefully clockwise to increase the Voltage, and anti-clockwise to reduce.

Switch off power at the switch and remove the power input cable. Reassemble the Mains Chassis Assembly to the cabinet and re-affix the smokehead bracket.

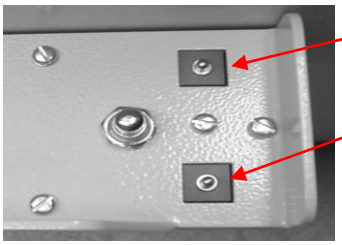
If faulty the power supply is non-repairable and should be replaced:
Ensure that the Mains Power input is removed. Remove the cables from the power supply noting their positioning. Remove the securing screws on the underside of the power supply and remove the unit. Replace the power supply and affix using securing screws. Re-affix the wires to their correct locations. Reassemble the Mains Chassis Assembly to the cabinet and re-affix the smokehead bracket.

Replacing the Charging contacts:

Before carrying out any work on the charging assembly - first ensure that all external connections are removed – in particular the Mains Power Input.

Charger base contact replacement will be required if the contacts have become severely corroded. Corrosion will occur if arcing has been taking place due to incorrect microswitch adjustment or can be a result of the contacts becoming dirty from contaminants and debris picked up from the workshop floor. Restricted movement of the contacts may also occur as a result of dirt or excessive heat from arcing.

The contacts are replaced as a complete contact block assembly DAS00553. Access to the contact block can be achieved by removing the cover on the cradle.



Remove central fixing screw of contact block assembly. and remove the contact block. The red lead is connected to the microswitch. Disconnect this red lead at the microswitch. The black lead of the contact block is connected to the power supply –V output.
Re-assemble the contact block and ensure there is free movement of the spring contacts (uninhibited by wire positioning). Re-connect the red lead to the microswitch and the black lead to the power supply –V.

Re-assemble all parts and covers. Re-connect the mains power supply and check the presence of 30Vdc +/- 0.2V at the pin contacts when the microswitch is operated.

Verifying RS232 Serial Communications (wired systems):

The correct operation and functioning of the wired DX260-1 Smokehead is the only means of verifying correct serial communications. When a (known good) Smokehead is first plugged in and powered up, its fan will operate briefly (for about 0.5 second)s. This indicates only that the Smokehead has power and has started running its own internal firmware program.

If incorrect operation of the Smokemeter system occurs, and any error message observed on the host PC screen, such as "Smokehead not Communicating", then it is possible the Serial Communications have failed. The most likely cause of a wired Smokehead communication failure is a defective cable. Damage to the cable may be caused by full or partial severing, damage to insulation or shorting of internal wire cores.

Any damage to the cable may prevent the smokemeter from starting up, and the brief start-up noise of the fan may not be heard. Attempt a software restart, and if the same message repeatedly occurs, then it may be necessary to replace/repair the RS232 cable.

First examine the Smokemeter cable for damage – any deep cuts in the outer sheath, or if any wire or braided screen becomes visible then the cable must be replaced. Then examine the external RS232 cable for damage. If this is OK then the internal cabling of the Interface base unit should be checked for damage.

APPENDIX 1 - Technical specification

A. SMOKE SAMPLING HEAD

Sampling type	Partial flow.
Light source	Green LED, wave length 560 mm.
Light intensity	8-step autorange for optimum light level
Effective optical path length	250 mm.
Physical response time	Less than 0.4 seconds (varies with gas velocity).
Range	0 - 100% opacity, 0 - 10.00 m^{-1}.
Accuracy	1.0% full scale (static).
Measuring cell temperature	70ºC min.
Warm-up time	10 minutes approx.
Operating conditions	-15º to +40ºC. 10-90% relative humidity (non condensing).
Wireless Range (DX260-1BT only)	Class 1 wireless Module provides up to 100 metres range (maximum range outdoors – line of sight).
Smoke temperature	Checked at the inlet to the measuring cell.
Smoke pressure	Controlled at ambient ± 3.75 mbar.
Sampling pipes	Flexible stainless steel, internal diameter 10 mm, lengths 875 mm (standard) 1,255 mm (under-chassis and vertical exhausts).
Lens cleaning	Wipe with soft cloth every 250 vehicle tests approx.
Calibration	Automatic electronic calibration (patented). Manual calibration (using neutral density filters).
Security	Sampling head serial number and software version held in permanent memory.
Fault diagnosis	Condition monitoring for - Dirty lenses, calibration failure, incorrect measuring cell temp.- Excessive smoke temp. etc.
Power	24V DC, 60W (DX260-1 only) - via Interface Box Internal battery (DX260-1BT only) - requires 30V 240W Charging Base
Housing	Aluminium extrusion with aluminium die cast end caps.
Protection	IP22.
Dimensions	450 x 200 x 80 mm.
Weight	3.2 Kg. (DX260-1) 3.9 Kg. (DX260-1BT)

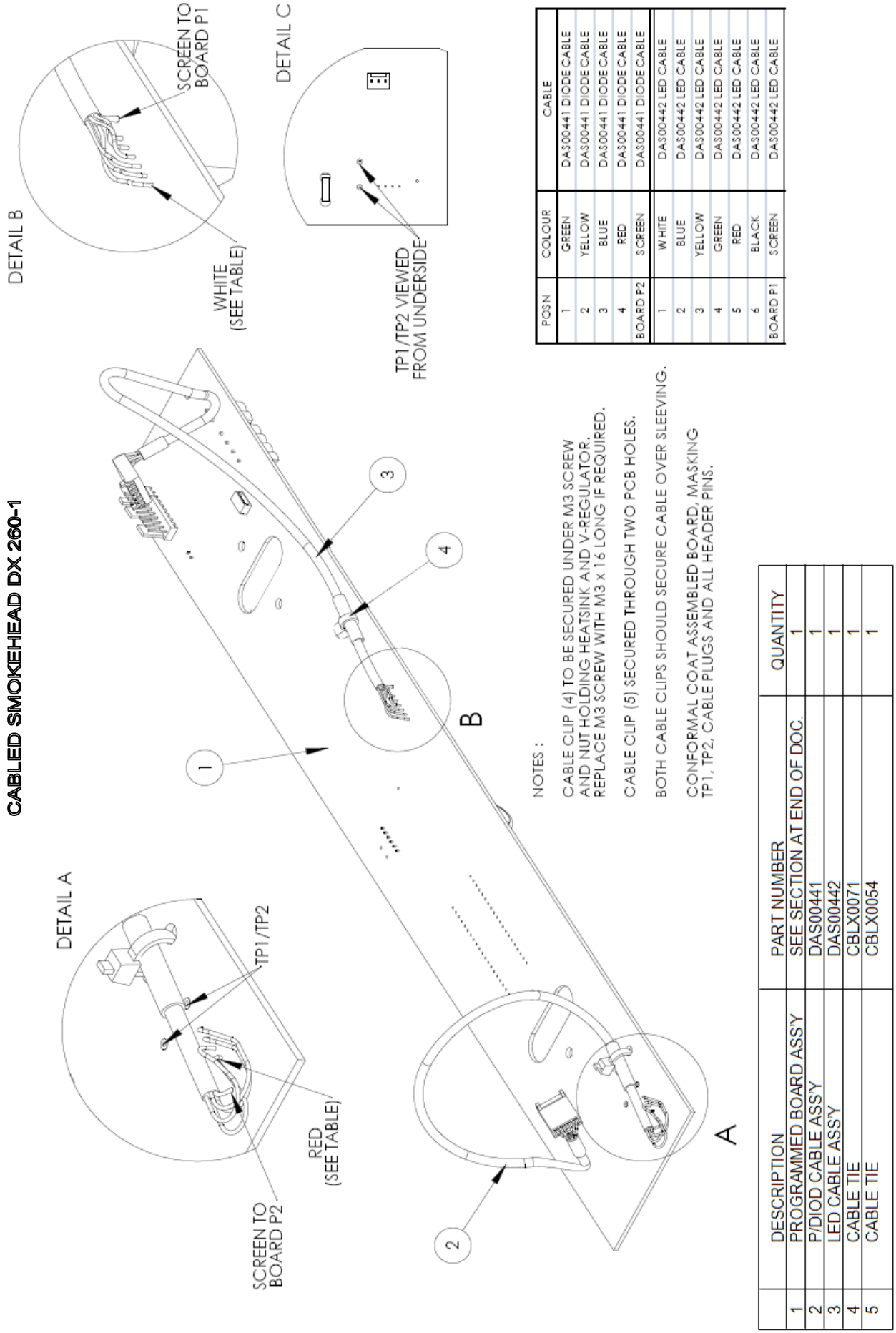
B. CONNECTING CABLE - SAMPLING HEAD TO POWER SUPPLY (DX260-1 only)

Construction	4-core screened.
Sheath	Polyurethane (for low temperature operation).
Length	10m (standard).

C. POWER SUPPLY - Interface Box (for DX260-1)/Charger Base (for DX260-1BT)

Power requirement	100–250V AC, 50/60Hz, 3.2A (Interface Box - DX260-1) 100-260v AC, 50/60Hz, 8.0A (Charger base - DX260-1BT)
Operating conditions	0 to + 40ºC. 10-90% relative humidity (non condensing).
Output (DX260-1IFP only)	RS232, 9-way 'D' (opacity, smoke temp.) 9,600 BAUD
Protection	IP20.

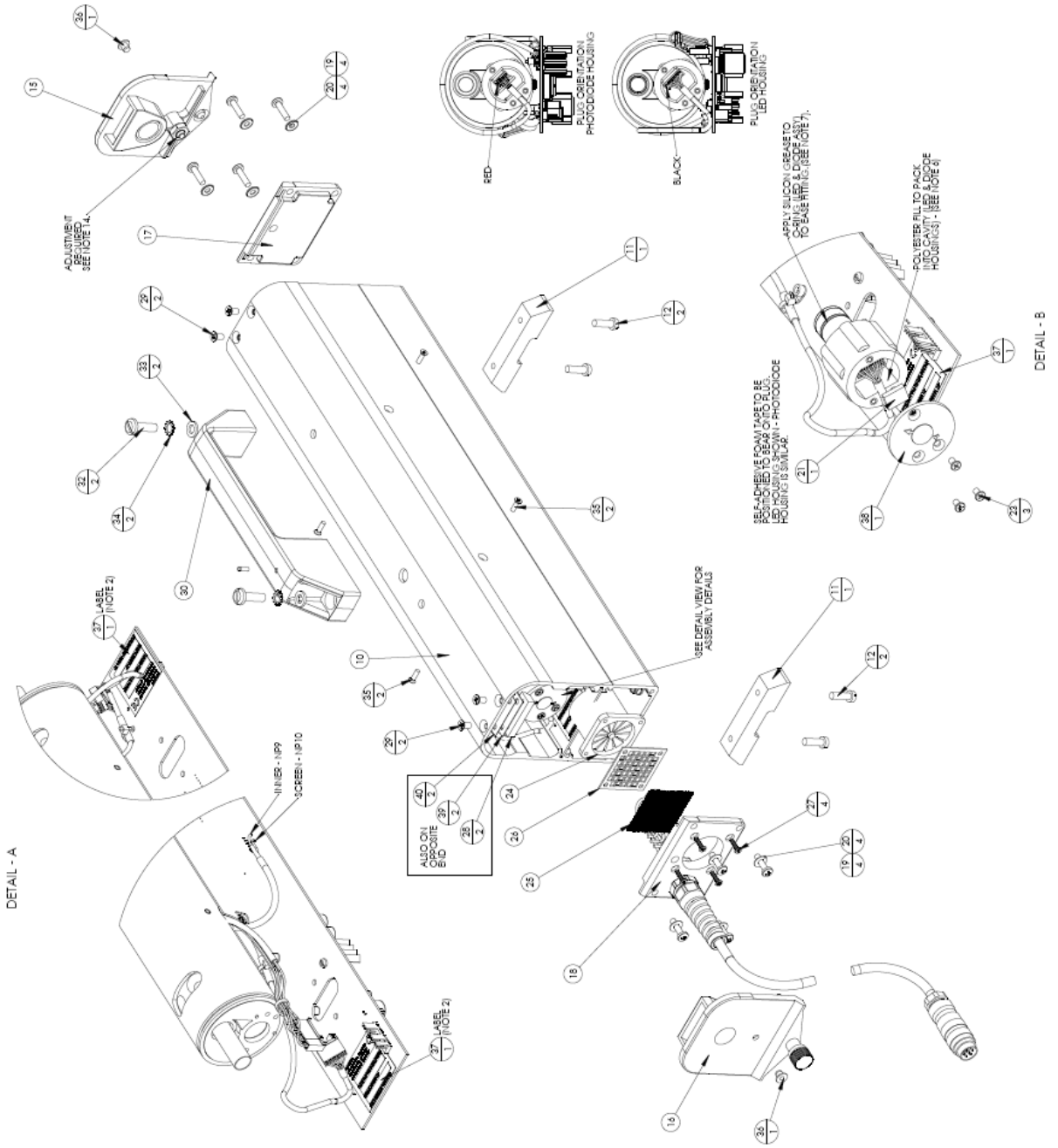
APPENDIX 2 - SPARES INFORMATION


CABLED SMOKEHEAD DX 260-1
DETAIL A
DETAIL B
DETAIL C
TP1/TP2
SCREEN TO BOARD P2
RED (SEE TABLE)
SCREEN TO BOARD P1
WHITE (SEE TABLE)
TP1/TP2 VIEWED FROM UNDERSIDE
A
B
1
2
3
4
NOTES :
CABLE CLIP (4) TO BE SECURED UNDER M3 SCREW AND NUT HOLDING HEATSINK AND V-REGULATOR. REPLACE M3 SCREW WITH M3 x 16 LONG IF REQUIRED.
CABLE CLIP (5) SECURED THROUGH TWO PCB HOLES.
BOTH CABLE CLIPS SHOULD SECURE CABLE OVER SLEEVING.
CONFORMAL COAT ASSEMBLED BOARD, MASKING TP1, TP2, CABLE PLUGS AND ALL HEADER PINS.

POSN	COLOUR	CABLE
1	GREEN	DAS00441 DIODE CABLE
2	YELLOW	DAS00441 DIODE CABLE
3	BLUE	DAS00441 DIODE CABLE
4	RED	DAS00441 DIODE CABLE
BOARD P2	SCREEN	DAS00441 DIODE CABLE
1	WHITE	DAS00442 LED CABLE
2	BLUE	DAS00442 LED CABLE
3	YELLOW	DAS00442 LED CABLE
4	GREEN	DAS00442 LED CABLE
5	RED	DAS00442 LED CABLE
6	BLACK	DAS00442 LED CABLE
BOARD P1	SCREEN	DAS00442 LED CABLE

	DESCRIPTION	PART NUMBER	QUANTITY
1	PROGRAMMED BOARD ASS'Y	SEE SECTION AT END OF DOC.	1
2	P/DIOD CABLE ASS'Y	DAS00441	1
3	LED CABLE ASS'Y	DAS00442	1
4	CABLE TIE	CBLX0071	1
5	CABLE TIE	CBLX0054	1

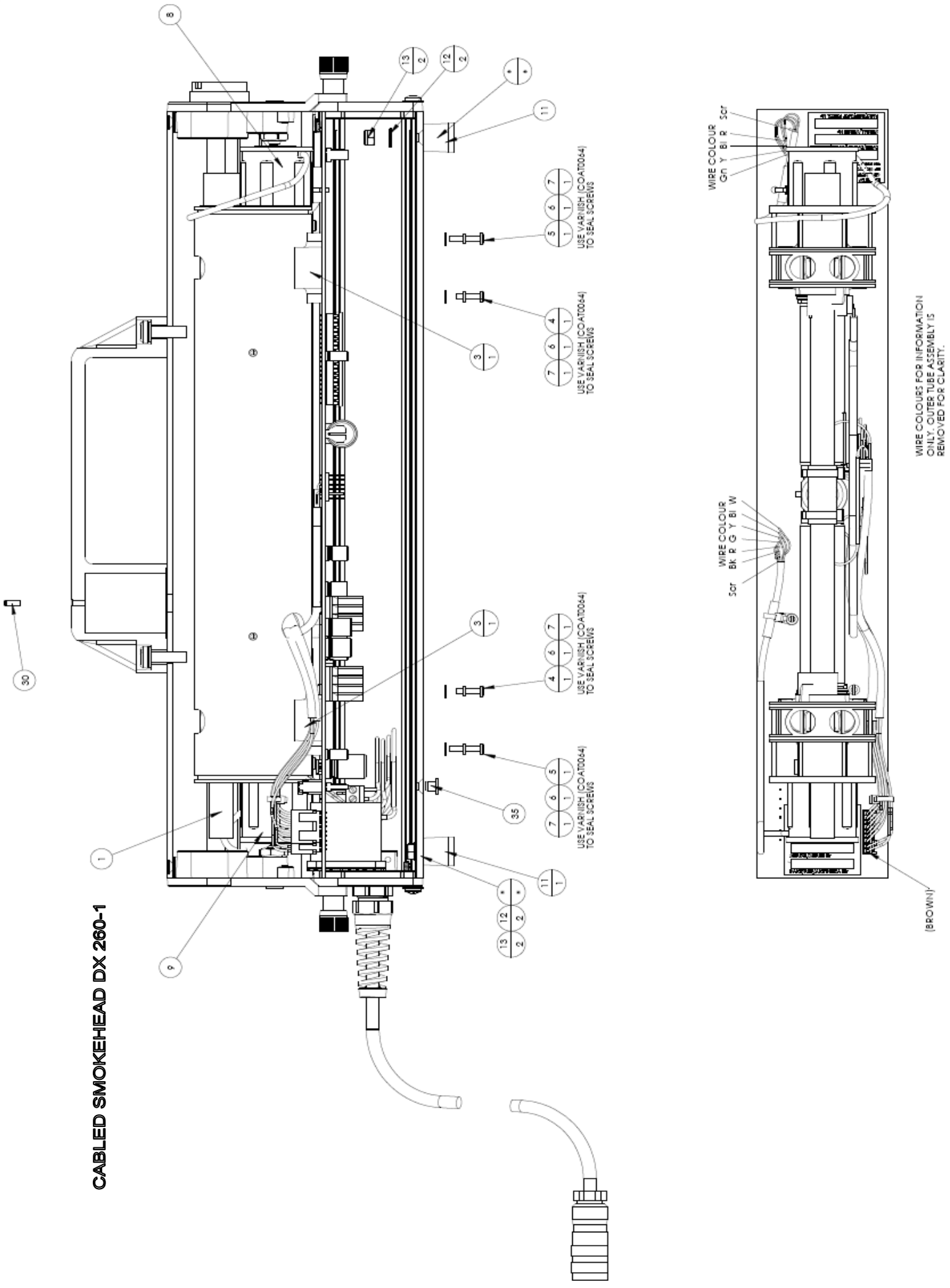
CABLED SMOKEHEAD DX 260-1


DETAIL - A
DETAIL - B
ADJUSTMENT REQUIRED SEE NOTE 14.
RED
BLACK
PLUG ORIENTATION PHOTODIODE HOUSING
PLUG ORIENTATION LED HOUSING
APPLY SILICON GREASE TO O-RING (RED & DIODE ASSY) TO EASE FITTING. (SEE NOTE 7).
SEE ADHESIVE FOAM TAPE TO BE APPLIED TO PHOTODIODE LED HOUSING SHOWN + PHOTODIODE HOUSING IS SIMILAR.
POLYESTER FILL TO PACK HOUSING WITH (SEE NOTE 6)
SEE DETAIL VIEW FOR ASSEMBLY DETAILS
ALSO ON OPPOSITE SIDE
INNER - NP9
SCREEN - NP10
LABEL (NOTE 2)

NOTES :

1. FIT FEET TO EXTRUSION USING M5 SCREWS, M5 WASHERS AND M5 NYLOC NUTS.
2. FIT SERIAL LABELS TO PC BOARD IN POSITIONS SHOWN. LABELS SHOULD BE MARKED WITH DATE OF MANUFACTURE AND SERIAL No ONLY. PART No. IS ADDED AT TOP LEVEL ASSEMBLY STAGE.
3. SOLDER MICROPHONE CABLE WIRES TO BOARD AS SHOWN IN DETAIL VIEW 'A'. THE SCREEN CONNECTION IS BLACK WIRE.
4. FIT MEASURING UNIT ASSEMBLY TO PC BOARD USING 2-M3 x 12 SCREWS, 2-M3 x 16 SCREWS, M3 SINGLE COIL WASHERS AND M3 FLAT WASHERS. NOTE THAT THE M3 x 16 SCREWS ARE THE OUTER PAIR THAT SCREW INTO THE VENTURI ASSEMBLY INSERTS.
5. PLUG 2-WAY AND 7-WAY CABLES INTO BOARD CONNECTORS.
6. PLUG IN 4-WAY CABLE INTO PHOTODIODE ASSEMBLY, AND 6-WAY CABLE INTO LED ASSEMBLY. THE PLUG LOCATORS SHOULD POINT TO THE SINGLE SCREW INSERT ON THE MOULDING. POSITION FOAM TAPE AND POLYESTER FILL AS PER DETAIL VIEW 'B'. SELF-ADHESIVE TAPE STICKS TO HOUSING CAPS WHEN POSITIONED WITHIN CAVITY OVER THE CABLE CONNECTOR. PACK POLYESTER FILL ROUND CONNECTOR, THEN FIT HOUSING CAPS TO APPROPRIATE LED HOUSING ASSEMBLY USING M3 x 6 SCREWS.
7. APPLY SILICON GREASE TO O-RING, AND PUSH PHOTODIODE AND LED HOUSING ASSEMBLIES INTO MEASURING UNIT.
8. SLIDE BOARD/MEASURING UNIT PART WAY INTO EXTRUSION, LEAVING 2-WAY FAN SOCKET AND ORANGE SOCKETS EXPOSED.
9. FIT FAN ASSEMBLY, FAN GRILLE AND FAN FILTER TO FIXED OUTLET ASSEMBLY USING #4 x 12 SCREWS.
10. PLUG FAN 2-WAY CONNECTOR AND HEAD CABLE ORANGE 4-WAY CONNECTOR INTO THEIR PCB SOCKETS. THEN SLIDE BOARD AND MEASURING UNIT ASSEMBLY INTO POSITION, SECURING WITH M3 x 10 CSK SCREWS.
11. FIT OUTLET ASSEMBLY TO BODY USING M4 x 16 POZI SCREWS AND M4 WASHERS.
12. FIT INLET FIXED END CAP TO BODY USING M4 x 16 SCREWS AND M4 WASHERS.
13. LOOSE-FIT LATCH BLOCKS TO EXTRUSION WITH M4 x 8 CSK SCREWS. ENSURE INLET AND OUTLET ASSEMBLIES CAN BE FITTED TIGHTENING SCREWS WHEN THEY ARE IN PLACE. NOTE - SHIMS TO BE SELECTED ON FINAL ASSEMBLY FOR CORRECT SPACING OF LATCH BLOCKS TO ENSURE GOOD SEALING OF REMOVEABLE INLET/OUTLET PLATES WHEN FITTED (NO VISIBLE AIR GAP OR SLOP) AND TO ALLOW UNHINDERED REMOVAL.
14. REMOVE INLET AND OUTLET ASSEMBLIES AND SLACKEN THE LOCKNUT ON THE SPRING LOADED PLUNGER. RE- FIT INLET AND OUTLET ASSEMBLIES TO EXTRUSION, AND ADJUST SPRING LOADED PLUNGER THROUGH END CAP HOLE BY TURNING CLOCKWISE UNTIL A SLIGHT PRESSURE IS FELT, THEN TURNING A FURTHER TWO TURNS. REMOVE END PLATES AND TIGHTEN LOCKNUT ENSURING PLUNGER DOES NOT MOVE. O-FEER ENDPLATE TO EXTRUSION AND CHECK THAT THE LOWEST PART OF THE ENDPLATE IS SPRING-LOADED 2-3mm AWAY FROM THE LOWER PLATE (3mm MAX). WHEN ADJUSTMENT IS COMPLETE, FIT BLANKING PLUG INTO END PLATE ADJUSTING HOLE.
15. LUBRICATE THUMB-SCREW THREADS WITH SILICONE GREASE, AND FIT PLATES.
16. PRESS LIGHT PIPE INTO HANDLE, THEN FIT HANDLE TO EXTRUSION USING M6 x 20 PH SCREWS, M6 WASHERS AND M6 SHAKEPROOF WASHERS.
17. FIT BLANKING PLUG INTO HOLE ON UNDERSIDE OF EXTRUSION.

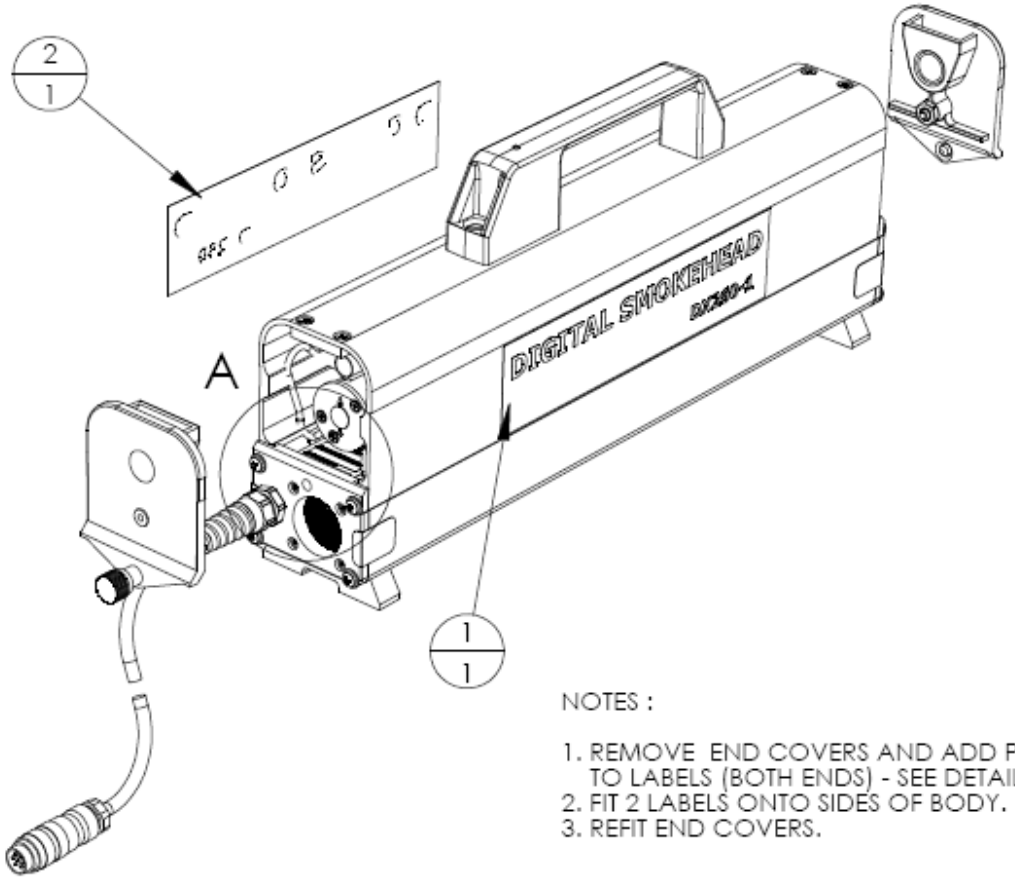
ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	DAS00488	MEASURING UNIT ASSEMBLY	1
2	DAS00483	WIRED BOARD ASSEMBLY	1
3	DX.230-100_95	CRADLE	2
4	SCRW7022	M3 x 12 PAN HD POZI	2
5	SCRW7023	M3 x 16 PAN HD POZI	2
6	WSHR1011	M3 SINGLE COIL WASHER	4
7	WSHR1010	M3 PLAIN WASHER	4
8	DAS00443	PHOTODIODE HOUSING ASSY	1
9	DAS00444	LED HOUSING ASSY	1
10	DDL00388	HEAD EXTRUSION	1
11	DX.210-1_23	FOOT	2
12	SCRW1055	M5X16 CH HD SCREW	4
13	WSHR1023	M5 FLAT WASHER	4
14	NUT51019	M5 NYLOC	4
15	DAS00485	REMOVABLE INLET ASSY	1
16	DAS00486	REMOVABLE OUTLET ASSY	1
17	DX.230-140_06	FIXED INLET END CAP	1
18	DAS00497	FIXED OUTLET ASSEMBLY	1
19	DMC404016	M4 x 16 PH POZI	8
20	WSHR1016	M4 FORM C WASHER	8
21	TAPE1007	FOAM TAPE	A/R
22	DDL00506	POLYESTER FILL	2
23	SCRW7019	M3 X 6 CSK POZI SCREW	6
24	DX.230-130_16	FAN ASSEMBLY	1
25	DDL00214	FAN FILTER	1
26	DX.230-130_11	FAN GRILLE	1
27	CSB704012	#4 x 12 CSK STAP POZI	4
28	DX.230-130_04	LATCH BLOCK	2
29	CMC404008	M4 x 8 CSK POZI	4
30	DDL00270	HANDLE	1
31	OPTL0080	LIGHT PIPE	1
32	DMC406020	M6 x 20 PH SLOTTED	2
33	WSHR1030	M6 FLAT WASHER	2
34	WSHR1033	M6 SHAKEPROOF	2
35	SCRW7020	M3 x 10 CSK POZI	4
36	PLUG3042	BLANKING PLUG	3
37	DDL00500	SERIAL LABEL	2
38	DX.210-1_62A	HOUSING CAP	2
39	DY230-130_05	LATCH SHIM 0.5	2
40	DY230-130_06	LATCH SHIM 0.25	2


WIRE COLOUR
Gn Y Bl R Scr
WIRE COLOUR
Scr Bk R G Y Bl W
WIRE COLOURS FOR INFORMATION ONLY. OUTER TUBE ASSEMBLY IS REMOVED FOR CLARITY.
(BROWN)
USE VARNISH (COAT0064) TO SEAL SCREWS
USE VARNISH (COAT0064) TO SEAL SCREWS
USE VARNISH (COAT0064) TO SEAL SCREWS

CABLED SMOKEHEAD DX 260-1

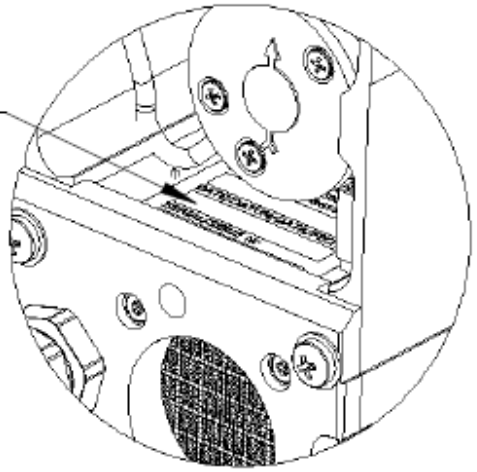
CABLED SMOKEHEAD DX 260-1

ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	DDL00510	DX260-1 LABEL	2
2	CAL VOID LABEL	CAL VOID LABEL	4
3	DAS00509	SMOKEHEAD COMMON ASSY	1



SMOKEHEAD TO BE PROGRAMMED WITH PRODUCT ID BADGING SOFTWARE AS SUPPLIED BY ENGINEERING.

PART NUMBER TO BE MARKED ON LABEL (BOTH ENDS). SEE VARIANT LIST ABOVE

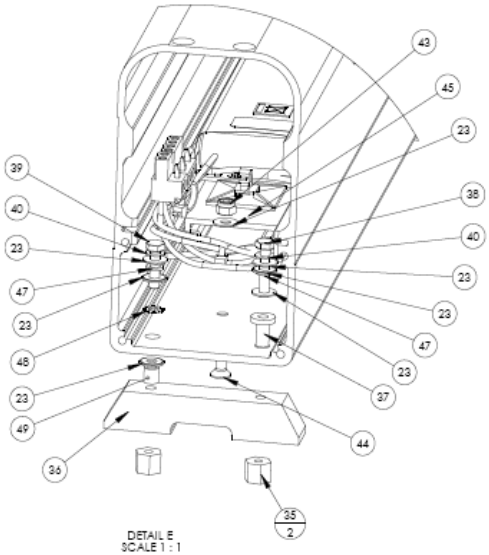


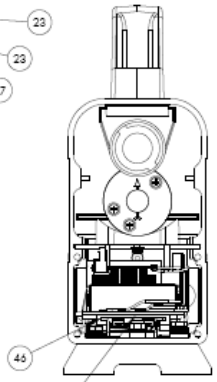
DETAIL A

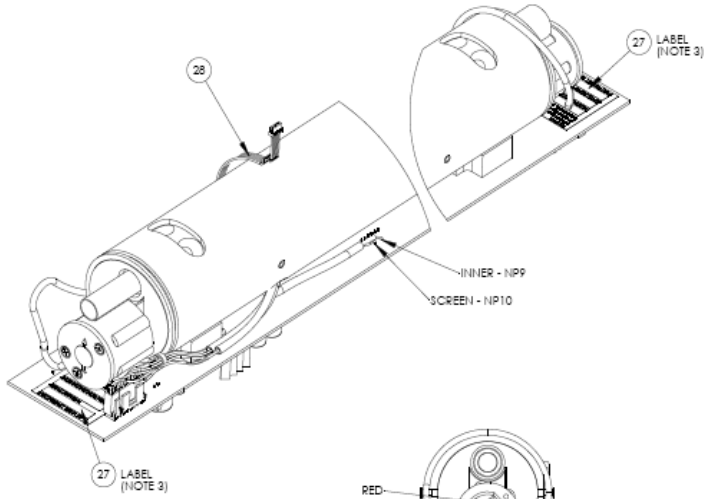
NOTES :

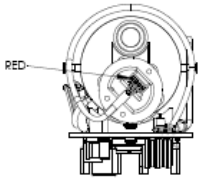
1. REMOVE END COVERS AND ADD PART NUMBER TO LABELS (BOTH ENDS) - SEE DETAIL VIEW 'A'.
2. FIT 2 LABELS ONTO SIDES OF BODY.
3. REFIT END COVERS.

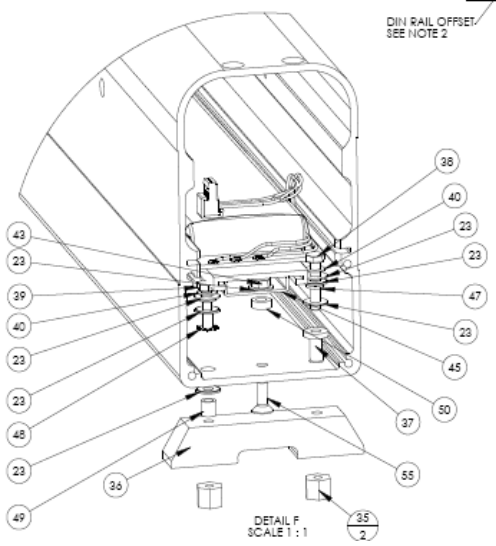
WIRELESS SMOKEHEAD DX 260-1BT

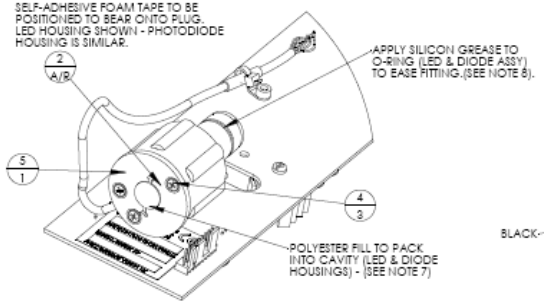






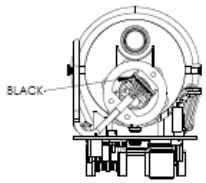





SELF-ADHESIVE FOAM TAPE TO BE POSITIONED TO BEAR ONTO PLUG. LED HOUSING SHOWN - PHOTODIODE HOUSING IS SIMILAR.
APPLY SILICON GREASE TO O-RING (LED & DIODE ASSY) TO EASE FITTING.(SEE NOTE 8).
POLYESTER FILL TO PACK INTO CAVITY (LED & DIODE HOUSINGS) - (SEE NOTE 7)

DETAIL - B

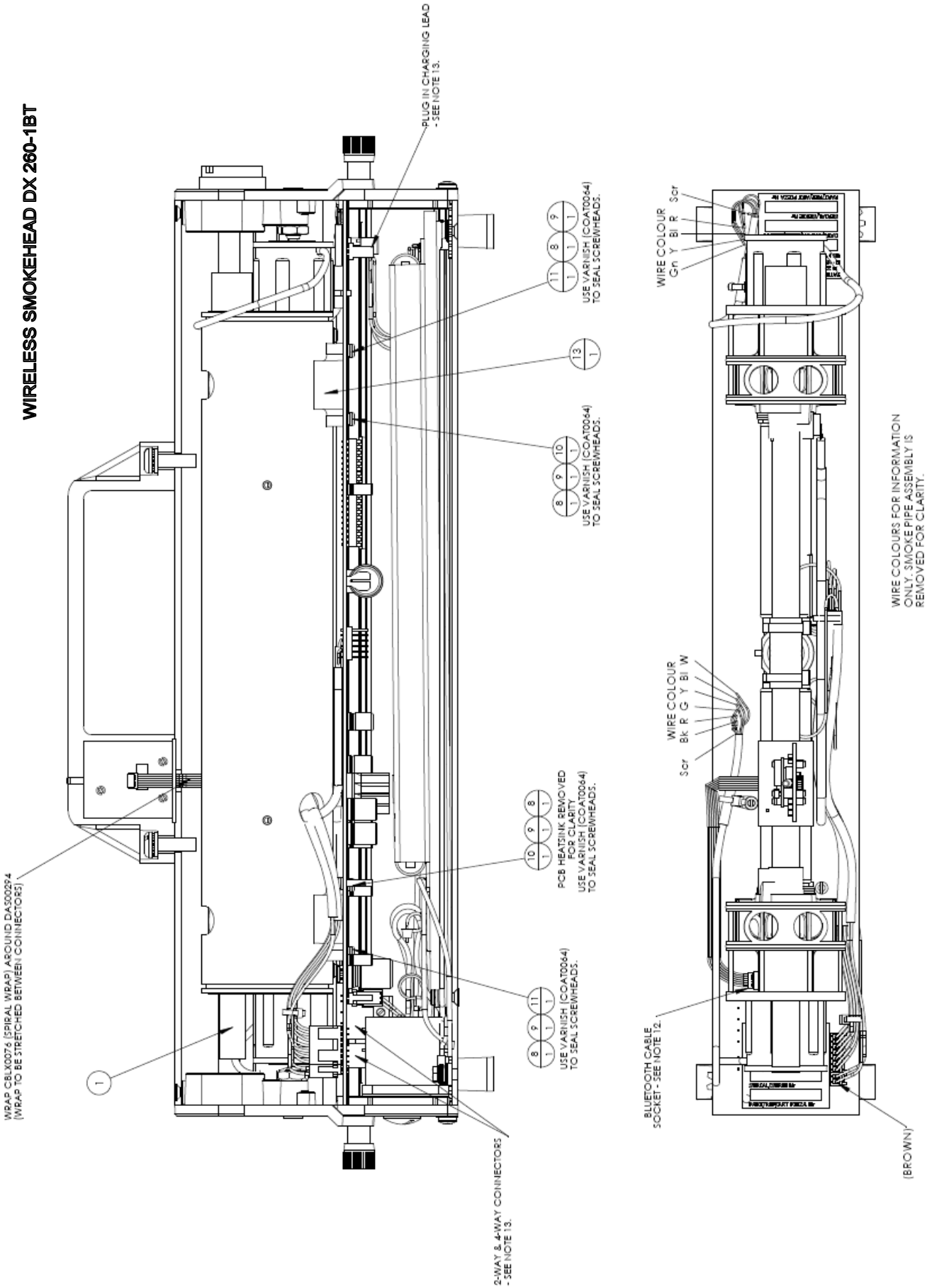
IDENTIFY ARROW TIPS ON BOTH HOUSING CAPS WITH WHITE PEN

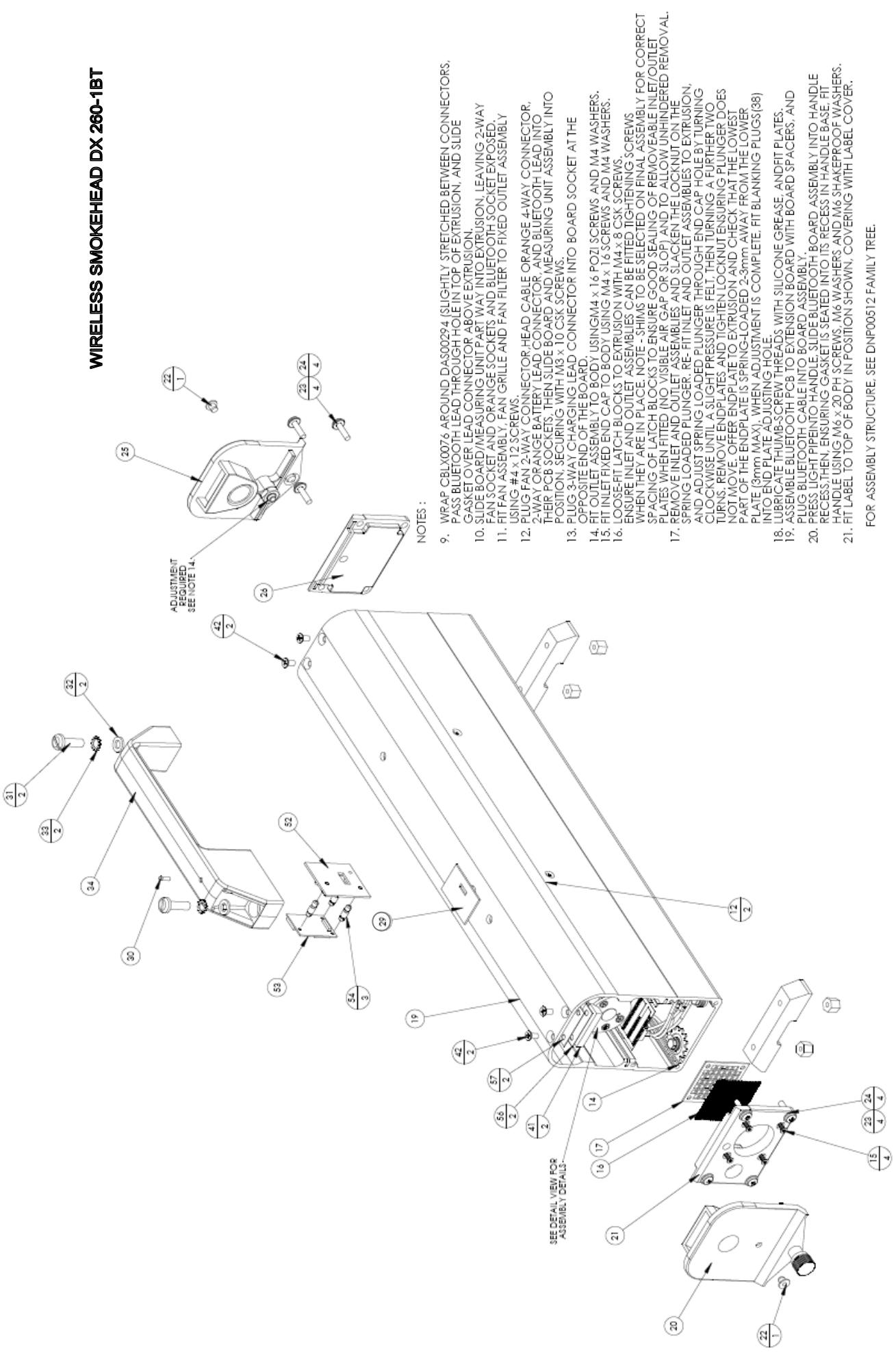


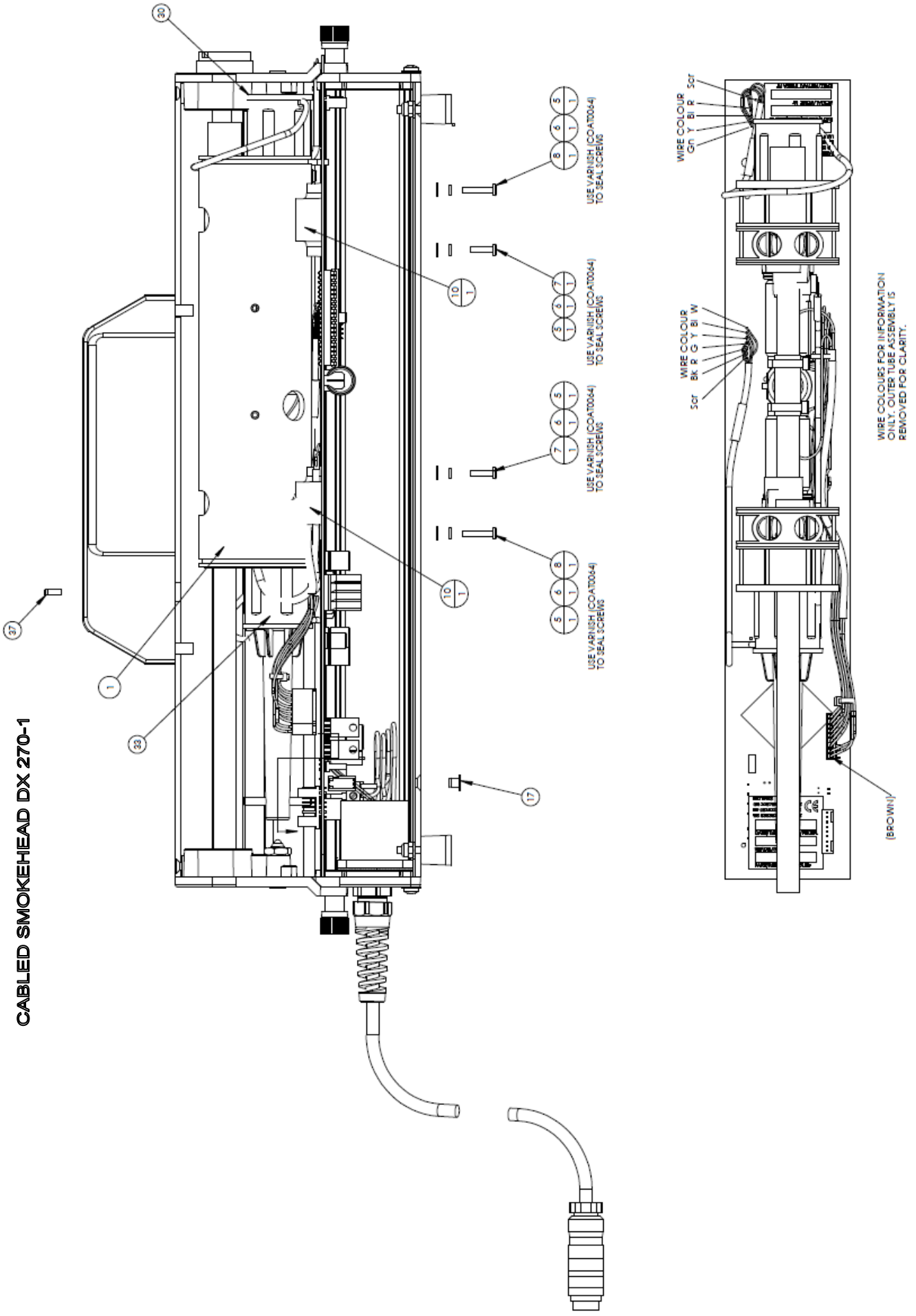
NOTES :

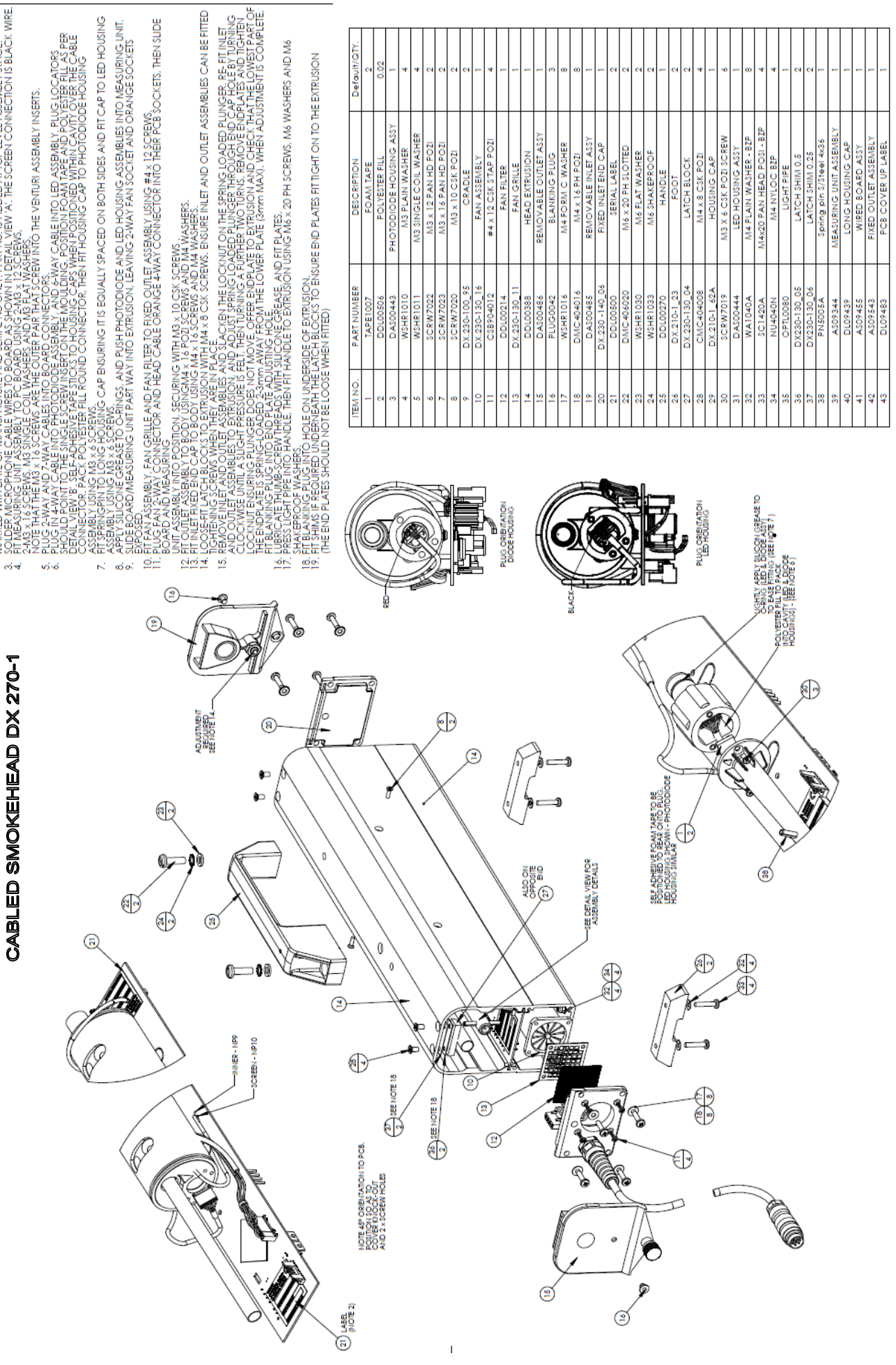
1. FIT FEET AND CHARGING LEAD TO EXTRUSION USING M4 SCREWS, M4 WASHERS, M4 SHAKEPROOF WASERS AND INSULATING BUSHES. NOTE THE BUILD FOR EACH CORNER AS SHOWN IN DETAIL VIEWS. ENSURE SCREWS ARE NOT OVERTIGHTENED WHICH RESULTS IN CHARGING CONTACTS BEING PULLED TOO FAR INTO THE FEET. IDEALLY CHARGING CONTACTS SHOUD BE 2mm RECESSED INTO FEET.
2. FIT DIN RAIL WITH M4 CSK SCREWS AND NYLOC NUTS. NOTE RAIL OFFSET IN DETAIL VIEW. SLIDE BATTERY PACK INTO POSITION WITH 2-CONNECTOR LEAD AT THE SAME END AS THE 4-CONNECTOR CHARGING LEAD.
3. FIT SERIAL LABELS TO PC BOARD IN POSITIONS SHOWN. LABELS SHOULD BE MARKED WITH DATE OF MANUFACTURE AND SERIAL No ONLY. PART No. IS ADDED AT TOP LEVEL ASSEMBLY STAGE.
4. SOLDER MICROPHONE CABLE WIRES TO BOARD AS SHOWN IN DETAIL VIEW 'A'. THE SCREEN CONNECTION IS BLACK WIRE.
5. FIT MEASURING UNIT ASSEMBLY TO PC BOARD USING 2-M3 x 12 SCREWS, 2-M3 x 16 SCREWS, M3 SINGLE COIL WASHERS AND M3 FLAT WASHERS. NOTE THAT THE M3 x 16 SCREWS ARE THE OUTER PAIR THAT SCREW INTO THE VENTURI ASSEMBLY INSERTS.
6. PLUG 2-WAY AND 7-WAY CABLES INTO BOARD CONNECTORS.
7. PLUG IN 4-WAY CABLE INTO PHOTODIODE ASSEMBLY, AND 6-WAY CABLE INTO LED ASSEMBLY. THE PLUG LOCATORS SHOULD POINT TO THE SINGLE SCREW INSERT ON THE MOULDING. POSITION FOAM TAPE AND POLYESTER FILL AS PER DETAIL VIEW 'B'. SELF-ADHESIVE TAPE STICKS TO HOUSING CAPS WHEN POSITIONED WITHIN CAVITY OVER THE CABLE CONNECTOR. PACK POLYESTER FILL ROUND CONNECTOR. THEN FIT HOUSING CAPS TO PHOTODIODE AND LED HOUSING ASSEMBLIES USING M3 x 6 SCREWS.
8. APPLY SILICONE GREASE TO O-RINGS, AND PUSH PHOTODIODE AND LED HOUSING ASSEMBLIES INTO MEASURING UNIT.

ITEM NO.	PART NUMBER	DESCRIPTION	Explode/QTY.
1	DAS00488	MEASURING UNIT ASSEMBLY	1
2	TAPE1007	FOAM TAPE	A/R
3	DDL00506	POLYESTER FILL	2
4	SCRW7019	M3 X 6 CSK POZI SCREW	6
5	DX.210-1_62A	HOUSING CAP	2
6	DAS00443	PHOTODIODE HOUSING ASSY	1
7	DAS00444	LED HOUSING ASSY	1
8	WSHR1010	M3 PLAIN WASHER	4
9	WSHR1011	M3 SINGLE COIL WASHER	4
10	SCRW7022	M3 x 12 PAN HD POZI	2
11	SCRW7023	M3 x 16 PAN HD POZI	2
12	SCRW7020	M3 x 10 CSK POZI	4
13	DX.230-100_95	CRADLE	2
14	DX.230-130_16	FAN ASSEMBLY	1
15	CSB904012	#4 x 12 CSK STAP POZI	4
16	DDL00214	FAN FILTER	1
17	DX.230-130_11	FAN GRILLE	1
18	DAS00483	WIRED BOARD ASSEMBLY	1
19	DDL00388	HEAD EXTRUSION	1
20	DAS00486	REMOVABLE OUTLET ASSY	1
21	DAS00513	FIXED OUTLET ASSY (BLUETOOTH)	1
22	PLUG0042	BLANKING PLUG	2
23	WSHR1016	M4 FORM C WASHER	22
24	DMC404016	M4 x 16 PH POZI	8
25	DAS00485	REMOVABLE INLET ASSY	1
26	DX.230 -140_06	FIXED INLET END CAP	1
27	DDL00500	SERIAL LABEL	2
28	DAS00294	BLUETOOTH CONNECTION LEAD	1
29	DDL00300	GASKET	1
30	OPTL0080	LIGHT PIPE	1
31	DMC406020	M6 x 20 PH SLOTTED	2
32	WSHR1030	M6 FLAT WASHER	2
33	WSHR1033	M6 SHAKEPROOF	2
34	DDL00270	HANDLE	1
35	DDL00293	CHARGING CONTACT	4
36	DX.210-1_23	FOOT	2
37	CPTX0049	INSULATING BUSH 4.1mm	2
38	SCRW3051	M4 x 20 HEX HEAD	2
39	SCRW3002	M4 x 16 HEX HEAD	2
40	WSHR1020	M4 SHAKEPROOF INT	4
41	DX.230-130_04	LATCH BLOCK	2
42	CMC404008	M4 x 8 CSK POZI	4
43	NUTS1014	M4 NYLOC	2
44	CMC404010	M4 x 10 CSK POZI	1
45	DDL00291	DIN RAIL	1
46	DX.260-1BT_01	BATTERY PACK	1
47	DAS00289	CHARGING LEAD	1
48	WSHR1019	M4 EXTERNAL WASHER	2
49	DX.210_139-04	SPACER	2
50	MNTG0081	3mm LG SPACER (4.2mm BORE)	1
51	CBLX0076	3.2mm SPIRAL WRAP	0.2m
52	AS09459	BLUETOOTH CARRIER BD	1
53	PSA80509	DX260-1BT PROGRAMMED BLUETOOTH MODULE	1
54	SP2019A	5.1mm SPACER	3
55	SC3412A	M4x12 CSK POZI -BZP	1
56	DX230-130_06	LATCH SHIM 0.25	2
57	DX230-130_05	LATCH SHIM 0.5	2


WIRELESS SMOKEHEAD DX 260-1BT
WRAP CBLX0076 (SPIRAL WRAP) AROUND DA500294
(WRAP TO BE STRETCHED BETWEEN CONNECTORS)
PLUG IN CHARGING LEAD
- SEE NOTE 13.
USE VARNISH (COAT0064)
TO SEAL SCREWHEADS.
PCB HEATSINK REMOVED
FOR CLARITY
2-WAY & 4-WAY CONNECTORS
- SEE NOTE 13.
WIRE COLOUR
Gn Y Bl R Scr
WIRE COLOUR
Scr Bk R G Y Bl W
BLUETOOTH CABLE
SOCKET - SEE NOTE 12.
(BROWN)
WIRE COLOURS FOR INFORMATION
ONLY. SMOKE PIPE ASSEMBLY IS
REMOVED FOR CLARITY.

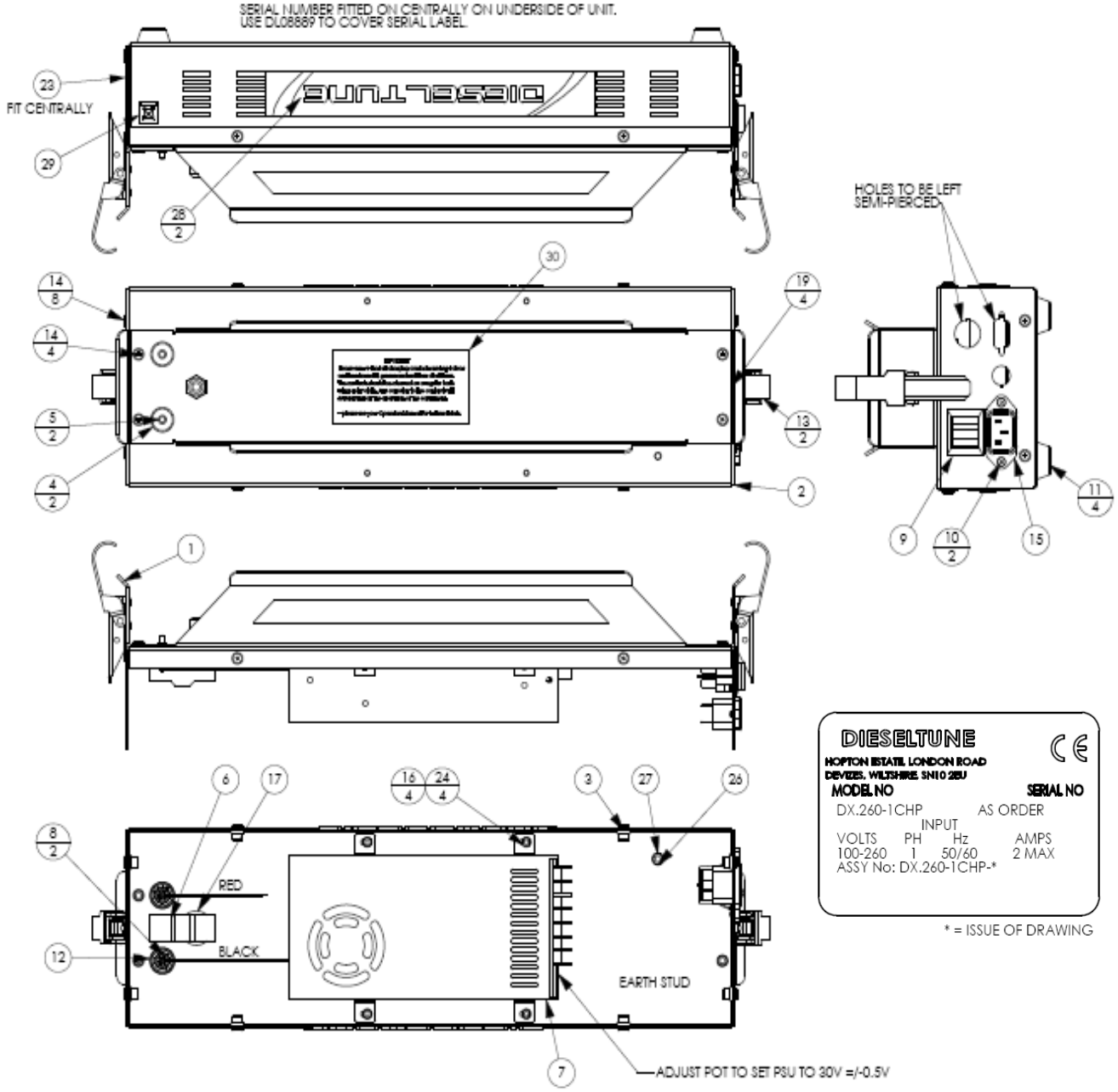

WIRELESS SMOKEHEAD DX 260-1BT
NOTES :
9. WRAP CBLX0076 AROUND DAS00294 (SLIGHTLY STRETCHED BETWEEN CONNECTORS, PASS BLUETOOTH LEAD THROUGH HOLE IN TOP OF EXTRUSION, AND SLIDE GASKET OVER LEAD CONNECTOR ABOVE EXTRUSION.
10. SLIDE BOARD/MEASURING UNIT PART WAY INTO EXTRUSION, LEAVING 2-WAY FAN SOCKET AND ORANGE SOCKETS AND BLUETOOTH SOCKET EXPOSED.
11. FIT FAN ASSEMBLY, FAN GRILLE AND FAN FILTER TO FIXED OUTLET ASSEMBLY USING #4 x 12 SCREWS.
12. PLUG FAN 2-WAY CONNECTOR,HEAD CABLE ORANGE 4-WAY CONNECTOR, 2-WAY ORANGE BATTERY LEAD CONNECTOR, AND BLUETOOTH LEAD INTO THEIR PCB SOCKETS, THEN SLIDE BOARD AND MEASURING UNIT ASSEMBLY INTO POSITION, SECURING WITH M3 x 10 CSK SCREWS.
13. PLUG 3-WAY CHARGING LEAD CONNECTOR INTO BOARD SOCKET AT THE OPPOSITE END OF THE BOARD.
14. FIT OUTLET ASSEMBLY TO BODY USINGM4 x 16 POZI SCREWS AND M4 WASHERS.
15. FIT INLET FIXED END CAP TO BODY USING M4 x 16 SCREWS AND M4 WASHERS.
16. LOOSE-FIT LATCH BLOCKS TO EXTRUSION WITH M4 x 8 CSK SCREWS, ENSURE INLET AND OUTLET ASSEMBLIES CAN BE FITTED TIGHTENING SCREWS WHEN THEY ARE IN PLACE. NOTE - SHIMS TO BE SELECTED ON FINAL ASSEMBLY FOR CORRECT SPACING OF LATCH BLOCKS TO ENSURE GOOD SEALING OF REMOVEABLE INLET/OUTLET PLATES WHEN FITTED (NO VISIBLE AIR GAP OR SLOP) AND TO ALLOW UNHINDERED REMOVAL.
17. REMOVE INLET AND OUTLET ASSEMBLIES AND SLACKEN THE LOCKNUT ON THE SPRING LOADED PLUNGER. RE- FIT INLET AND OUTLET ASSEMBLIES TO EXTRUSION, AND ADJUST SPRING LOADED PLUNGER THROUGH END CAP HOLE BY TURNING CLOCKWISE UNTIL A SLIGHT PRESSURE IS FELT, THEN TURNING A FURTHER TWO TURNS. REMOVE ENDPLATES AND TIGHTEN LOCKNUT ENSURING PLUNGER DOES NOT MOVE. OFFER ENDPLATE TO EXTRUSION AND CHECK THAT THE LOWEST PART OF THE ENDPLATE IS SPRING-LOADED 2-3mm AWAY FROM THE LOWER PLATE (3mm MAX). WHEN ADJUSTMENT IS COMPLETE, FIT BLANKING PLUGS(38) INTO END PLATE ADJUSTING HOLE.
18. LUBRICATE THUMB-SCREW THREADS WITH SILICONE GREASE, ANDFIT PLATES.
19. ASSEMBLE BLUETOOTH PCB TO EXTENSION BOARD WITH BOARD SPACERS, AND PLUG BLUETOOTH CABLE INTO BOARD ASSEMBLY.
20. PRESS LIGHT PIPEINTO HANDLE, SLIDE BLUETOOTH BOARD ASSEMBLY INTO HANDLE RECESS,THEN, ENSURING GASKET IS SEATED INTO ITS RECESS IN HANDLE BASE, FIT HANDLE USING M6 x 20 PH SCREWS, M6 WASHERS AND M6 SHAKEPROOF WASHERS.
21. FIT LABEL TO TOP OF BODY IN POSITION SHOWN, COVERING WITH LABEL COVER.
FOR ASSEMBLY STRUCTURE, SEE DNP00512 FAMILY TREE.
ADJUSTMENT REQUIRED SEE NOTE 14
SEE DETAIL VIEW FOR ASSEMBLY DETAILS


CABLED SMOKEHEAD DX 270-1
WIRE COLOUR
Gn Y Bl R Scr
WIRE COLOUR
Bk R G Y Bl W
Scr
WIRE COLOURS FOR INFORMATION ONLY. OUTER TUBE ASSEMBLY TO REMOVED FOR CLARITY.
(BROWN)
USE VARNISH (COAT0064) TO SEAL SCREWS
USE VARNISH (COAT0064) TO SEAL SCREWS
USE VARNISH (COAT0064) TO SEAL SCREWS
USE VARNISH (COAT0064) TO SEAL SCREWS

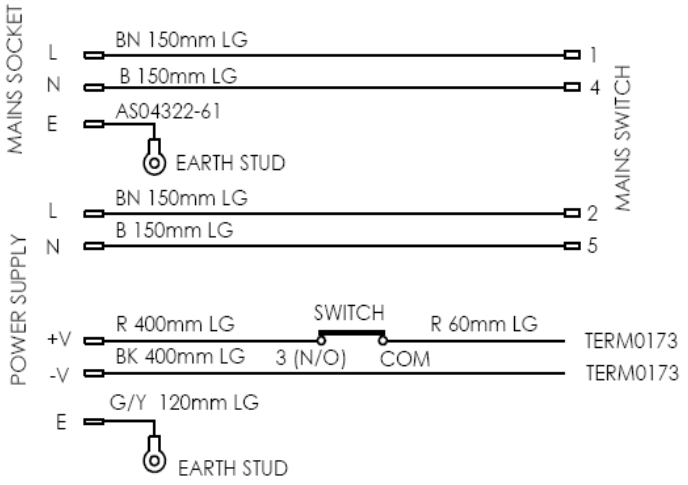

CABLED SMOKEHEAD DX 270-1
1. FIT FEET TO EXTRUSION USING M5 SCREWS, M5 WASHERS AND M5 NYLOC NUTS.
2. FIT SERIAL AND PCB COVER UP LABELS TO PC BOARD IN POSITIONS SHOWN. LABELS SHOULD BE MARRIED WITH DATE OF MANUFACTURE AND SERIAL No ONLY. PART No. IS ADDED AT TOP LEVEL ASSEMBLY STAGE.
3. SOLDER MICROPHONE CABLE WIRES TO BOARD AS SHOWN IN DETAIL VIEW 'A'. THE SCREEN CONNECTION IS BLACK WIRE.
4. FIT MEASURING UNIT ASSEMBLY TO PC BOARD USING 2-M3 x 12 SCREWS.
2-M3 x 16 SCREWS, M3 SINGLE COIL WASHERS AND M3 FLAT WASHERS.
NOTE THAT THE M3 x 16 SCREWS ARE THE OUTER PAIR THAT SCREW INTO THE VENTURI ASSEMBLY INSERTS.
5. PLUG 2-WAY AND 7-WAY CABLES INTO BOARD CONNECTORS.
6. PLUG IN 4-WAY CABLE INTO PHOTODIODE ASSEMBLY, AND 6-WAY CABLE INTO LED ASSEMBLY. PLUG LOCATORS SHOULD POINT TO THE SINGLE SCREW INSERT ON THE MOULDING. POSITION FOAM TAPE AND POLYESTER FILL AS PER DETAIL VIEW 'B'. SELF-ADHESIVE TAPE STICKS TO HOUSING CAPS WHEN POSITIONED WITHIN CAVITY OVER THE CABLE CONNECTOR. PACK POLYESTER FILL ROUND CONNECTOR. THEN FIT HOUSING CAP TO PHOTODIODE HOUSING ASSEMBLY USING M3 x 6 SCREWS.
7. FIT SPRING PIN TO LONG HOUSING CAP ENSURING IT IS EQUALLY SPACED ON BOTH SIDES AND FIT CAP TO LED HOUSING ASSEMBLY USING M3 x 6 SCREWS.
8. ASSEMBLY SILICONE GASKETS AND PUSH PHOTODIODE AND LED HOUSING ASSEMBLIES INTO MEASURING UNIT.
9. SLIDE BOARD/MEASURING UNIT PART WAY INTO EXTRUSION, LEAVING 2-WAY FAN SOCKET AND ORANGE SOCKETS EXPOSED.
10. FIT FAN ASSEMBLY, FAN GRILLE AND FAN FILTER TO FIXED OUTLET ASSEMBLY USING #4 x 12 SCREWS.
11. PLUG FAN 2-WAY CONNECTOR AND HEAD CABLE ORANGE 4-WAY CONNECTOR INTO THEIR PCB SOCKETS. THEN SLIDE BOARD AND MEASURING UNIT ASSEMBLY INTO POSITION, SECURING WITH M3 x 10 CSK SCREWS.
12. FIT OUTLET ASSEMBLY TO BODY USING M4 x 16 POZI SCREWS AND M4 WASHERS.
13. FIT INLET FIXED END CAP TO BODY USING M4 x 16 SCREWS AND M4 WASHERS.
14. LOOSE-FIT LATCH BLOCKS TO EXTRUSION WITH M4 x 8 CSK SCREWS. ENSURE INLET AND OUTLET ASSEMBLIES CAN BE FITTED TIGHTENING SCREWS WHEN THEY ARE IN PLACE.
15. REMOVE INLET AND OUTLET ASSEMBLIES AND SLACKEN THE LOCKNUT ON THE SPRING LOADED PLUNGER. RE-FIT INLET AND OUTLET ASSEMBLIES TO EXTRUSION, AND ADJUST SPRING LOADED PLUNGER THROUGH END CAP HOLE BY TURNING CLOCKWISE UNTIL A SLIGHT PRESSURE IS FELT. THEN TURNING A FURTHER TWO TURNS. REMOVE ENDPLATES AND TIGHTEN LOCKNUT ENSURING PLUNGER DOES NOT MOVE. OFFER ENDPLATE TO EXTRUSION AND CHECK THAT THE LOWEST PART OF THE ENDPLATE IS SPRING-LOADED 2-3mm AWAY FROM THE LOWER PLATE (3mm MAX). WHEN ADJUSTMENT IS COMPLETE, FIT BLANKING PLUG INTO END PLATE ADJUSTING HOLE.
16. LUBRICATE THUMB-SCREW THREADS WITH SILICONE GREASE, AND FIT PLATES.
17. PRESS LIGHT PIPE INTO HANDLE. THEN FIT HANDLE TO EXTRUSION USING M6 x 20 PH SCREWS, M6 WASHERS AND M6 SHAKEPROOF WASHERS.
18. FIT BLANKING PLUG INTO HOLE ON UNDERSIDE OF EXTRUSION.
19. FIT SHIMS IF REQUIRED UNDERNEATH THE LATCH BLOCKS TO ENSURE END PLATES FIT TIGHT ON TO THE EXTRUSION (THE END PLATES SHOULD NOT BE LOOSE WHEN FITTED)
RED
PLUG ORIENTATION DIODE HOUSING
BLACK
PLUG ORIENTATION LED HOUSING
ADJUSTMENT REQUIRED SEE NOTE 14
SEE NOTE 18
SEE NOTE 18
ADD ON OPPOSITE END
SEE DETAIL VIEW FOR ASSEMBLY DETAILS
INNER - WP9
SCREEN - WP10
NOTE 45º ORIENTATION TO PCB. POSITION AS SHOWN TO COVER AND EXPOSE OUT AND 2 x SCREW HOLES
LABEL (NOTE 2)
SELF ADHESIVE FOAM TAPE TO BE POSITIONED TO READ ONTO PLUG HOUSING SINGLE SCREW - PHOTODIODE
LIGHTLY APPLY SILICON GREASE TO O'RING AND PLUG TO EASE FITTING (SEE NOTE 7)
POLYESTER FILL TO PACK INTO CAVITY (LED & DIODE HOUSINGS) - (SEE NOTE 6)

ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY:
1	TAPE1007	FOAM TAPE	2
2	DDL00506	POLYESTER FILL	0.02
3	DA300443	PHOTODIODE HOUSING ASSY	1
4	WSHR1010	M3 PLAIN WASHER	4
5	WSHR1011	M3 SINGLE COIL WASHER	4
6	SCRW7022	M3 x 12 PAN HD POZI	2
7	SCRW7023	M3 x 16 PAN HD POZI	2
8	SCRW7020	M3 x 10 CSK POZI	2
9	DX.230-100_95	CRADLE	2
10	DX.230-130_16	FAN ASSEMBLY	1
11	C6BP04012	#4 x 12 CSK STAP POZI	4
12	DDL00214	FAN FILTER	1
13	DX.230-130_11	FAN GRILLE	1
14	DDL00388	HEAD EXTRUSION	1
15	DA300486	REMOVABLE OUTLET ASSY	1
16	PLUG0042	BLANKING PLUG	3
17	WSHR1016	M4 FORM C WASHER	8
18	DMC404016	M4 x 16 PH POZI	8
19	DA300485	REMOVABLE INLET ASSY	1
20	DX.230-140_06	FIXED INLET END CAP	1
21	DDL00500	SERIAL LABEL	2
22	DMC406020	M16 x 20 PH SLOTTED	2
23	WSHR1030	M6 FLAT WASHER	2
24	WSHR1033	M6 SHAKEPROOF	2
25	DDL00270	HANDLE	1
26	DX.210-1_23	FOOT	2
27	DX.230-130_04	LATCH BLOCK	2
28	CMC404008	M4 x 8 CSK POZI	4
29	DX.210-1_62A	HOUSING CAP	1
30	SCRN7019	M3 X 6 CSK POZI SCREW	6
31	DA300444	LED HOUSING ASSY	1
32	WA1040A	M4 PLAIN WASHER - BZP	8
33	SC1420A	M4x20 PAN HEAD POSI - BZP	4
34	NU4040N	M4 NYLOC BZP	4
35	OPTL0080	LIGHT PIPE	1
36	DX230-130_05	LATCH SHIM 0.5	2
37	DX230-130_06	LATCH SHIM 0.25	2
38	FN5005A	Spring pin S/Steel 4x36	1
39	A309344	MEASURING UNIT ASSEMBLY	1
40	DL09439	LONG HOUSING CAP	1
41	A309455	WIRED BOARD ASSY	1
42	A309543	FIXED OUTLET ASSEMBLY	1
43	DL09483	PCB COVER UP LABEL	1

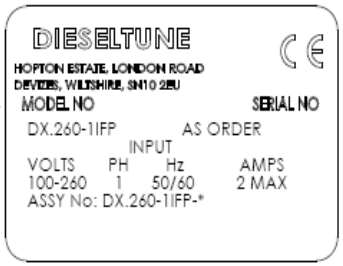
WIRELESS SMOKEHEAD CHARGING BASE DX 260-1CHP



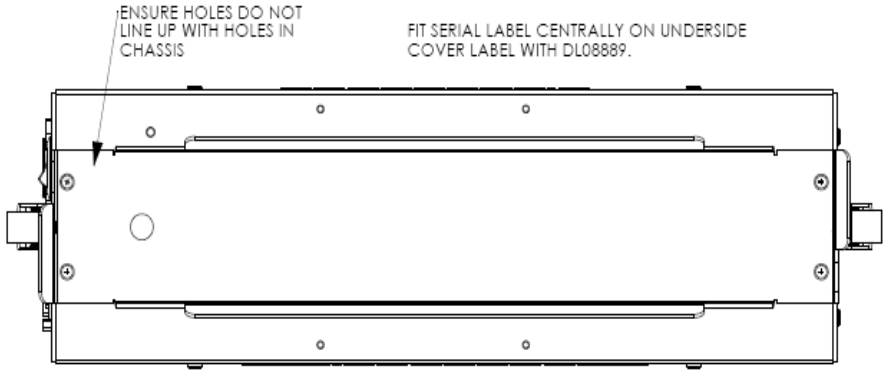
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	DDL00589	CRADLE	1
2	DDL00587	CHASSIS	1
3	DDL00588	COVER	1
4	DDL00590	CONTACT BLOCK	2
5	TERM0173	4mm DOMED CONTACT	2
6	SWIT5055	SPDT SWITCH	1
7	PWRS0031	POWER SUPPLY	1
8	WSHR1082	5mm PUSH ON FIXING	2
9	SWIT5029	DPST ON / OFF SWITCH	1
10	RIVT0007	CSK POP RIVET	2
11	RUBR9025	RUBBER FOOT	4
12	WSHR1087	10mm PUSH ON FIXING	2
13	FAST0063	LATCH	2
14	SCRW7004	M4 x 10 EARTH NIB	12
15	CONN0083	MAINS INLET SOCKET	1
16	WSHR1010	M3 PLAIN WASHER	4
17	WSHR1086	M12 FLAT WASHER FORM B	1
18	AS04322-61	M4 TAG TO FASTON 120mm LONG	1
19	RIVT0002	3.2mm DIA POP RIVET	4
20	DAS00593	SUPPLY WIRING	1
21	LABL0027	LABEL	1
22	DL08889	LABEL COVER	1
23	DLB72381	INTERNATIONAL WARNING LABEL	1
24	NUTS1006	M3 NYLOC	4
25	WSHR1016	M4 PLAIN	1
26	WSHR1020		1
27	NUTS1010	M4 FULLNUT	1
28	DDL00594	DIESELTUNE LOGO	2
29	LABL0031	WHEELED BIN LABEL	1
30	DL09338	CONTACTS WARNING LABEL	1

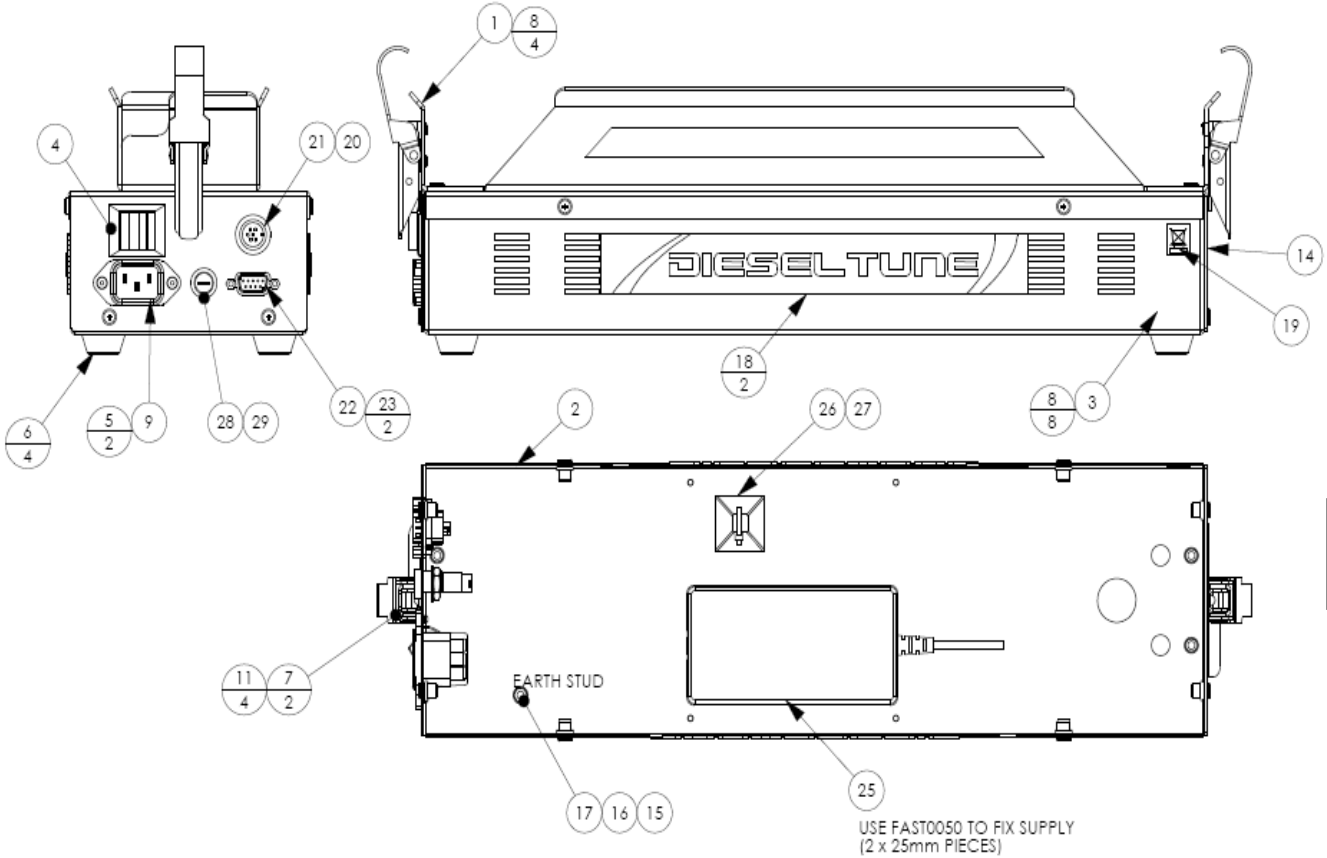


CABLED SMOKEHEAD INTERFACE BOX DX 260-1IFP



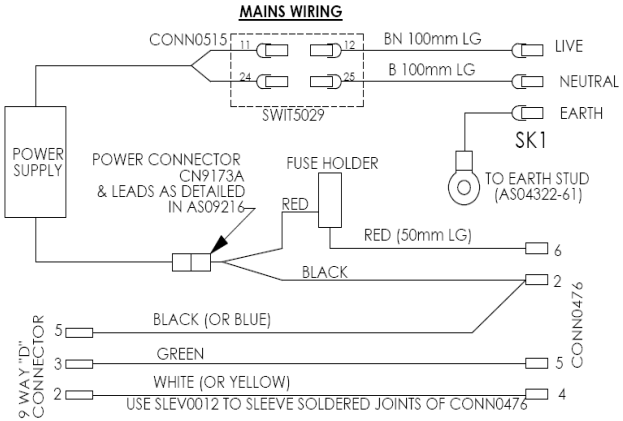
* = ISSUE OF DRAWING





ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	DL09220	CRADLE	1
2	DDL00587	CHASSIS	1
3	DDL00588	COVER	1
4	SWIT5029	DPST ON / OFF SWITCH	1
5	RIVT0007	CSK POP RIVET	2
6	RUBR9025	RUBBER FOOT	4
7	FAST0063	LATCH	2
8	SCRW7004	M4 x 10 EARTH NIB	12
9	CONN0083	MAINS INLET SOCKET	1
10	AS04322-61	M4 TAG TO FASTON 120mm LONG	1
11	RIVT0002	3.2mm DIA POP RIVET	4
12	LABL0027	LABEL	1
13	DL08889	LABEL COVER	1
14	DLB72381	INTERNATIONAL WARNING LABEL	1
15	WSHR1016	M4 PLAIN	1
16	WSHR1020	M4 INT SHAKEPROOF WASHER	1
17	NUTS1010	M4 FULLNUT	1
18	DDL00594	DIESELTUNE LOGO	2
19	LABL0031	WHEELED BIN LABEL	1
20	NUTS1049	M18 NUT	1
21	CONN0476	6 WAY CONNECTOR	1
22	AS09216	SUPPLY WIRING	1
23	CONX0349	SCREWLOCK	2
24	FAST0050	VELCRO	0.1m
25	PWRS0035	POWER SUPPLY	1
26	CBLX0063	CABLE TIE BASE	1
27	CBLX0054	CABLE TIE	1
28	FUSH0021	FUSE HOLDER	1
29	FUSE0045	3.15 QUICKBLOW FUSE	1
30	SLEV0012	HEAT RESISTANT SLEEVING	0.08m

MAINS WIRING



Smokehead Processor Board – Part Numbers

To replace the processor board in the field the board needs to be configured for the market it is intended for. Please use the following numbers to order the variant you require:

PSA80522	Crypton (UK)
PSA80523	Holland
PSA80524	Belgium (TAE)
PSA80525	Denmark
PSA80527	Export Hartridge
PSA80528	Hong Kong
PSA80529	South Africa
PSA80530	India
PSA80536	Germany

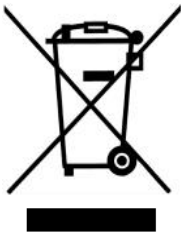
SERVICE & SUPPORT

For after-sales support please see the label inside the equipment door for customer support contact details.

Crypton can provide information and contracts covering the following: Car Data; Fault Code Information; Diagnostic Information; Software Support Contracts; Software Updates & Accessories.

Overseas Customers
Service and spare parts cover outside the UK is provided by the agent from whom your equipment was purchased.

Disposal of equipment



- Do not dispose of this equipment as miscellaneous solid municipal waste but arrange to have it collected separately.
- The re-use or correct recycling of electronic equipment (EEE) is important in order to protect the environment and the wellbeing of humans.
- In accordance with European Directive WEEE 2002/96/EC, special collection points are available for the delivery of waste electrical and electronic equipment.
- The public administration and producers of electrical and electronic equipment are involved in facilitating the processes of the re-use and recovery of waste electrical and electronic equipment through the organisation of collection activities and the use of appropriate planning arrangements.
- Unauthorised disposal of waste electrical and electronic equipment is punishable by law with appropriate penalties.

Disposal of batteries

- Batteries must be recycled or disposed of properly.
- Do not throw batteries away as part of normal refuse disposal.
- Do not throw batteries into open flame.